MILITARY REVIEW

U. S. ARMY COMMAND AND GENERAL STAFF COLLEGE
FORT LEAVENWORTH, KANSAS

SEPTEMBER 1959 VOLUME XXXIX NUMBER 6

XUM

U. S. Army Command and General Staff College

COMMANDANT	Maj Gen Lionel C. McGarr
ASSISTANT COMMANDANT	Brig Gen F. R. Zierath
DEPUTY POST COMMANDER	Col F. A. Liwski, Arty
CHIEF OF STAFF	Col H. L. Ash, Inf
SECRETARY, USA CGSC	Col E. S. McKee, Inf
CHIEF OF RESIDENT INSTRUCTION	Col R. H. Schellman, Inf
CHIEF OF NONRESIDENT INSTRUCTION	Col R. H. Van Volkenburgh, Jr., Arty
CHIEF OF COMBAT DEVELOPMENTS	Col R. C. Works, Inf
CHIEF OF DOCTRINE	Col V. W. Hobson, Inf

XUM

Military Review

EDITOR IN CHIEF
COL RODGER R. BANKSON, INF

MANAGING EDITOR
LT COL GEORGE B. MACAULAY, ARTY

SPECIAL SECTIONS EDITOR
LT COL CLEO S. FREED, ARMOR

SPANISH-AMERICAN EDITION
Editor
MAJ GILBERTO GONZÁLEZ-JULIÁ, INF
Assistant Editors
MAJ TOMÁS H. GUFFAIN, INF
CAPT ANTONIO BUDET, INF

BRAZILIAN EDITION
Editor
MAJ ALBERTO DE ASSUMPÇÃO CARDOSO, INF
Assistant Editor
MAJ MAURÍCIO FELIX DA SILVA, ARTY

ADMINISTRATIVE OFFICER
MAJ FRED M. STOWELL, AGC

PRODUCTION OFFICER
LT COL LOUIS RUIZ, CMLC

STAFF ARTIST
CHARLES A. MOORE

MISSION.

The MILITARY REVIEW, official publication of the United States Army and the United States Army Command and General Staff College, disseminates modern military thought and current Army doctrine concerning command and staff procedures of the division and higher echelons and provides a forum for articles which stimulate military thinking. Authors, civilian and military alike, are encouraged to submit articles which will assist in the fulfillment of this mission.

POLICY.

Unless otherwise indicated, the views expressed in the original articles in this magazine are those of the individual authors and not those of the Department of the Army or the United States Army Command and General Staff College.

Editor.

The printing of this publication has been approved by the Secretary of the Army 29 June 1959.

MILITARY REVIEW—Published monthly by U. S. Army Command and General Staff College, Fort Leavenworth, Kansas, in English, Spanish, and Portuguese. Second-class postage paid at Fort Leavenworth, Kansas. Subscription rates: $3.50 (US currency) a year in the United States, United States military post offices, and those countries which are members of the Pan-American Postal Union (including Spain): $4.50 a year in all other countries.

XUM

MILITARY REVIEW

VOLUME XXXIX SEPTEMBER 1959 NUMBER 6

CONTENTS

Keeping Pace With the Future—The Power of Thought—New Horizons ---- 3
Major General Lionel C. McGarr, United States Army

Political-Military Consultation Among Allies ---- 20
Dr. David F. Trask

Body Armor: How It Worked ---- 29
Captain Roger W. Little, Medical Service Corps

Only the Best Go North ---- 34
Major Frank B. Case, Transportation Corps

Lundy's Lane—What to Do With an Objective ---- 45
Captain Carl M. Guelzo, Transportation Corps

The United States Air Force ---- 52

Give It Guidance ---- 63
Lieutenant Colonel Stephen Silvasy, Artillery

MILITARY NOTES AROUND THE WORLD ---- 74

MILITARY DIGESTS ---- 84
Unification by Evolution ---- 84
Soviet Military Art and Science ---- 93
Concerning Strategic Depth ---- 101
The Atomic Army ---- 107

BOOKS OF INTEREST TO THE MILITARY READER ---- 110

XUM

KEEPING PACE WITH THE FUTURE--

Major General Lionel C. McGarr, *USA*
Commandant, U. S. Army Command and General Staff College

The only way to prevent ossification of mind is to accept nothing as fixed, to realize that the circumstances of war are everchanging, and that consequently organization, administration, strategy and tactics must change also. . . . Adherence to dogmas has destroyed more armies and lost more battles and lives than any other cause in war. **—Major General J. F. C. Fuller**

This article is intended to stimulate THOUGHT, specifically at user level, on a subject—Doctrinal Development—which requires continuing critical analysis and creative thought to ensure flexible, forward-looking concepts for the future.

THE mind of man is the most wondrous work of our Creator and its capabilities for accomplishment are boundless. But even this marvelous mechanism has its Achilles' heel, and the so-called "military mind" is no exception. Down through the

XUM

ages, human nature has resisted the change dictated by progress. Men have hidden their failure to think objectively or creatively under the cloak of convention, conservatism, and conformity. Too often they were rationalizing their own mental laziness. Even today this self-imposed "mental block" tends to prevent a breakthrough in the art of war commensurate with the astounding technological revolution now in progress. This obstacle must be overcome by a comparable breakthrough in the art of thinking!

The equation of battlefield success—firepower plus mobility plus communications, over terrain, times leadership equals critical force at the point of decision—is a fair capsulization of the art of war. Technology has recently changed the value of this equation by vastly increasing two of the tangible factors—firepower and mobility. To obtain the optimum battlefield results, the mind of man, heart of the intangible leadership factor, must generate the necessary mental energy to thrust itself past the gravitational pull of mental inertia—this is the *power of thought.*

In this upside-down world, conditioned by tensions and opposing ideologies, we must remember that our national security cannot be preserved by a second-best combination of ideas, concepts, doctrine, or hardware. There will be no second prize, only subjugation, for the nation which is not mentally, psychologically, morally, and physically prepared should the blow fall. We must be alert to the nature, scope, and complexity of the threat and understand that military force alone cannot cope with the politico-economic and important opinion-forming aspects of the struggle. While science and technology only recently have placed the military might of the conspiratorial Red aggressor on our borders, his "ideological weapons" have been in action on our very doorstep for some time. We must not allow ourselves to be paralyzed or rendered impotent by Communist "ideological fallout." Avoidance of this danger requires aggressive imagination, education, and continuing emphasis on the psychological aspects of combat, "fourth dimension warfare," at all levels of decision—both civil and military—as well as awareness of the whole spectrum of conflict. The die of war is cast by preceding events—not by the initial enemy assault. History proves that more civilizations have fallen from internal doubt and indecision than from "armed aggressors storming the ramparts."—That the *will* of a people is all important!

We must reactivate and revitalize belief in our national traditions and sense of values into a bold, aggressive defense of our way of life. We must rededicate ourselves to the precepts of service and sacrifice to our country while continuing our search for a coordinated, comprehensive strategy and means of maintaining the initiative. More important, we must work with a *Purpose*—we must recapture the sense of destiny which carried our forefathers from New England to the shores of the Pacific Ocean. The militant Communist believes in *his* strategy and purpose—*world domination through world revolution*! He is "out-believing" us which gives strength to his confidence in his "all-conquering" destiny. He is willing to sacrifice and die for his "holy" dogma and his objective of enslaving and remolding the world. Mr. Khrushchev's crude, "We will bury you," is nothing new. It merely restates the objective often enunciated by those other high priests of communism—Marx, Lenin, and Stalin. Khrushchev uses such terms as Cato used in reiterating his continuing call for the destruction of Carthage. His tactic of "desiring peaceful coexistence" cannot be taken at face value. As a Communist and especially as an avowed Leninist, *any* so-called peace which Mr. Khrushchev is ideologically free to

accept must support the Communist concept of "continuing revolution."

The foreign policy of the Soviet Union, the blueprint for its international strategy, has actually been a war policy since its inception—a policy depending heavily on the *threat* of military force. "Peace" to the Communist is merely a breathing spell between hot wars while his continuing revolution goes on. Communist dogma confuses by clothing basically hostile policy in peaceful raiment—using both peace-loving words and ideas as tactical weapons! This accounts for the "Alice in Wonderland" flavor of Communist pronouncements which, combined with new techniques of communication and dissemination, constitute a formidable weapons system in this art of "shadow warfare" —a type of conquest which subordinates formal war to the more subtle, yet equally deadly, psychological-subversive conflict. Today, Lenin's ideological concept based on a doctrine of conspiracy, strife, and duplicity, backed by naked military force, is being accentuated by the Soviets in the most powerful, coordinated, sustained bid for world domination the world has ever seen. No longer a "country bumpkin" in scientific ability, Communist Russia is busily forging a modern, balanced, military supporting team to complement her psychological, political, industrial, and subversive drives. Although her actual willingness to resort to this ready military might is problematical, she has too often convinced the world of her ability and intent to use it, if necessary, to gain her objectives. Thus, the *threat* posed by this war machine has allowed her to exploit the psycho-politico field and situations short of war without assuming an undue risk of direct, overt warfare.

Although the American soldier does not engage in politics, and justly so, he must understand the impact of politics on the over-all practice of his Art. In this respect, as an instrument of national policy and an eminent member of the Tri-Service Defense Team, the Army and its posture are as much affected by National policy which sets national and supporting military strategy as by the technological developments which lead to tactical innovations in support of this strategy. Improved communications, tactical nuclear weapons, and nuclear-carrying missiles by "shrinking" the world are tending to place military tactics in the realm formerly occupied exclusively by military strategy. More than ever, national policy decisions impact on the manner in which the tactical commander must fight. The mold of the National Defense Team set by the original massive retaliation concept has not yet reacted to the required degree to include later concepts of a more mobile, flexible, tailored application of nuclear force—and the full implication of the intercontinental ballistic missile remains to be evaluated.

Major General Lionel C. McGarr was graduated from the United States Military Academy in 1928 and subsequently served with the 25th, 24th, 21st, and 30th Infantry Regiments. He went to French Morocco with the 30th Infantry Regiment, 3d Division, in 1942 serving in combat there and in Italy. He became Commander of the 30th Infantry in 1943 in which capacity he served in Italy, France, and Germany. He was named Assistant Commander, 3d Infantry Division in Germany where he served until November 1945. He graduated from the National War College in 1947 and was assigned to the Intelligence Division of the Army General Staff that year. He commanded the 350th Infantry Regiment in Austria, was Tactical Inspector of US Forces in Austria, and in 1951 was named Chief of Staff of the Tactical Command of these forces. In July 1952 General McGarr went to Korea as Assistant Commander of the 2d Infantry Division, later becoming Commanding General of the United Nations Prisoner of War Command. He assumed command of the 7th Infantry Division in Korea in October 1953. In 1954 he was designated CG USARCARIB in the Canal Zone. He assumed command of the U. S. Army Command and General Staff College in July 1956.

XUM

With the Soviets employing limited war and exploiting situations short of war to circumvent our general war deterrent strength, the national defense posture, as well as the Nation's capability for psycho-politico-economic conflict, must continue to adjust to counter Soviet strategy. Since Soviet military strength is basically ground strength and ground forces primarily are being used in limited war by our enemies, it is logical to expect that national requirements will dictate greater strength and capacity for highly *mobile*, tailored, dual capability Army forces such as the Strategic Army Corps (STRAC)—appropriately teamed with the Sister Services.

The Doctrinal Challenge

With the threat identified and stated, what is the soldier's contribution to effective countermeasures? The answer is *continuous* readiness for *sustained* combat at any time or place and under any possible combination of conditions. For the Army in the Field, such preparedness demands the fusion of highly trained manpower and modern materiel into a cohesive, balanced combat team by progressively evolving, forward-looking tactical and logistical concepts. *This requires strengthening the mental development of our officer corps and the continuing development of the best possible Army doctrine.* It also demands a full understanding by the American people of the complexity of the present world leadership role of our country. For as General Marshall so truly said, ". . . military policy is dependent on public opinion."

History contains many examples of mental unpreparedness at varying levels —the failure of nations and commanders to recognize initially the full capabilities of new weapons. Even more significant have been the failures to recognize conceptually new *combinations* of old weapons—which emphasizes the need for a fuller exploitation of weapons and weapons systems now in our hands. This "mental lag" has too often resulted in disastrous defeat or the sacrifice of valuable opportunities. In World War II, a combination of two World War I weapons—the tank and airplane—produced the concept of "Blitzkrieg." French formations employing tanks comparable to Nazi Panzers were decisively defeated in attempting to apply 1918 tactical concepts on the 1940 Blitzkrieg battlefield. Likewise, as the world leader in commercial aviation, we failed to recognize fully the applicability of transport aircraft to military operations until the Luftwaffe forcibly demonstrated the potentialities of airborne forces in Holland and Crete. Late recognition by the Allies of the potency of the psycho-politico-ideological "fifth column" tactic is another such example. Although historically new weapons have been seized upon by armies, new ideas for their best use normally have come far behind. Time, Allies, and Oceans permitted us the luxury of these conceptual lapses in the past. The pace of modern warfare and the destructive power of modern weapons preclude this privilege now and in the future.

Without disregarding pertinent lessons of experience, professional, creative, military thinking, rapidly translated into the realities of organizations, operational concepts and hardware, is essential for full military preparedness. We can and will meet this challenge unless complacency and compromise dull our mental potential. The tactical concepts which carried Guderian's Panzers from the Rhine to Dunkirk were developed, not in the crucible of war, but in peacetime General Staff councils and the classrooms of the Kriegs Academy at Potsdam. This was no scientific breakthrough. France was defeated by a "mental breakthrough" in the art of war! A breakthrough made possible by a handful of creative, military thinkers. How disheartening for the French Gen-

eral Staff to recognize that equally advanced concepts propounded in 1934 by a progressive young Lieutenant Colonel, Charles de Gaulle, had fallen by the wayside—victims of mental inertia and satisfaction with the *status quo*. In our thinking, we must keep in mind that the most "permanent" element in weapons and tactics is change!

The seven league stride of technology may well have crammed more progress into the past 15 years than the preceding 15 centuries. With this realization it has become quite clear that scientific and technological progress, in developing new hardware, is often easier to achieve than doctrinal progress—developing new concepts and effecting their complete integration as a component of combat power. This is because of the mounting complexity of doctrinal development which with its human and ethical values, leadtimes, and divergent opinions is normally a more difficult area to resolve than the problems of the laboratory or the factory. Doctrinal progress is also more complex than technological progress in that professional military thinking cannot limit itself to hardware to the exclusion of new tactics and ideas which may be relatively independent of hardware—such as leadership, moral issues, communication, psychology, and organization. Although doubtful if military application could ever fully exploit the fruits of technology available at any given time, national survival dictates that this be accomplished to the maximum possible degree.

Therefore, the military professional must continually seek to shed the cloak of convention and complacency in a never-ending search for realistic, practical answers for tomorrow's problems *today*. He must attempt to fully integrate military knowledge, talent, and experience with the capabilities of the researcher, engineer, physical scientist, industrialist, political scientist, educator, psychologist, and clergyman to realize the full potential of this magnificent All-American team—thus the military constantly seeks urgently required improvement in organizations and procedures for the development of doctrine and materiel. In this regard, we must be guided by the realization that nuclear age doctrine cannot, of necessity, be overly reliant on previous combat experience. True, we must build on the lessons of history where still applicable—but we must ferret out that which has become obsolete and produce a replacement based on progressive thinking and evaluated theory supported to the maximum possible extent by field test. This will require continuing critical self-analysis and reassessment of the basic validity of principles and fundamentals which previously have been accepted without challenge.

The Immediate Postwar Period

A difficult period of reevaluation throughout the Armed Forces occurred during the years closely following World War II. The Army, together with the Army School System, was struggling to evaluate lessons learned and analyzing the important impact of nuclear weapons on tactical concepts and concepts for administrative support (logistics, personnel, and civil affairs). However, with some notable exceptions, Army doctrinal thinking, in spite of Hiroshima and Nagasaki, tended to be lulled into a false sense of security by the success of World War II concepts. Army organizations, combat proved on battlefields and in communications zones throughout the world, generally underwent only minor, piecemeal adjustment. Although considerable study was given to this problem during the period, the wartime infantry division, basic unit of the Combined Arms Team, remained essentially unchanged until 1957. Military concepts published and taught, not fully considering the threat of mass destruction weapons and the various forms of unconventional warfare, were generally

XUM

those employed by the Allied army groups advancing shoulder to shoulder across Western Europe. Nuclear weapons were considered primarily in the strategic role. Even the perfection of the tactical 280-mm nuclear projectile did not initially result in a full realization of the *tactical* potential of the nuclear era—and the space age was still in the future.

There were a number of factors which, coupled with the postwar letdown of the traditionally nonmilitaristic peoples of the Free World, tended to hold back doctrinal progress during this period. Possibly foremost among these was the United States monopoly of what the Free World considered to be the "ultimate" strategic weapon. It was held that no nation would risk national suicide by daring to attack us militarily. In light of this philosophy, both the US and her Allies considered this deterrent power sufficient to allow progressive, peacetime reduction of ground combat strength. In the opinion of some, we were already prepared for Armageddon, so why concern ourselves too greatly with conventional or nuclear ground operations. The popular appeal of the "overnight" war employing the air-nuclear weapon was naturally easy to accept.

In addition, the Army's doctrinal system, highly effective in the past, had evolved from a much slower rate of technological and tactical development and was geared to change based mainly on battlefield experience. New doctrine was developed primarily as a byproduct of instruction in the Army Service Schools and field training while combat development type activity was conducted more or less independently by various agencies of the arms and services. The inertia and time-lag inherent in this system operated to inhibit urgently needed progress and adjustment necessitated by the scientific breakthrough which dawned upon the world at Alamagordo. Another important factor was the age-old tendency of man to cling to the known in preference to the unknown; the almost biological urge of the soldier to accept only that which is battle-tested and to avoid nonbattle tested theory—no matter how valid this theory might appear.

Then, in the fall of 1949, the Soviets exploded their first nuclear weapon. The Free World monopoly of nuclear know-how was broken. Overnight the US nuclear capability was transformed from a benevolent keeper of the peace into a vital massive retaliation deterrent, necessary for our national survival. Emboldened, but still realizing American superiority in nuclear weapons coupled with the Strategic Air Command's retaliatory power, the Soviets turned to the tactic of limited war used selectively in conjunction with the continuing cold war offensive to gain their ends and influence world opinion. Our own massive retaliation threat was turned against us by skillful propaganda techniques, while overt action in numerous limited war situations was carried out by satellite pawns and Communist controlled "volunteers." In these incidents shrewdly selected objectives enabled the Soviets to operate with a minimum danger of creating an issue which would warrant a nuclear strike by the US on their homeland.

This period saw Indochina and Korea —both limited wars of significant size and duration in which nuclear power did not make itself felt. These wars emphasized the inflexibility of a strategy based solely

Doctrine is principles and policies applicable to a subject which have been developed through experience or theory that represent the best available thought, and indicate and guide but do* not *bind in practice

on massive retaliation and reemphasized the requirement for a military force capable of waging successfully *any* type of war—nuclear or nonnuclear.

Meanwhile, science acquired skills necessary to produce a wide variety of nuclear warheads. Among them were some designed with target selection and speed of reaction capabilities necessary to support close ground maneuver—tactical type weapons—arms which might serve equally well in the big or little war. Surface-to-surface delivery systems with both tactical and strategic mobility were designed, tested, and put into production. Improved Army air vehicles and other materiel became available. True, for many items there were only prototypes, but the military characteristics of the equipment were known and the capability to produce the item established. However, attention necessarily given the nonnuclear Korean War, the time needed to digest post-World War II technological advances, and a natural tendency to allow current forces and resources to govern future doctrine, all acted to restrict the Army's progress to piecemeal improvements on existing organizations and concepts. Thus, in large measure, the historical "realization gap" between the development of a new weapon and its full adaptation to military use continued to exist.

The Present Period

Recognizing the need to accommodate to the nuclear age, the Army toward the close of the Korean conflict initiated a comprehensive evaluation of its doctrinal and materiel development program. In 1955 this self-analysis resulted in a major adjustment of the doctrinal development system based on the recommendations of the Haworth Committee * and other study groups—particularly with respect to the closely related functions shown in Figure 1.

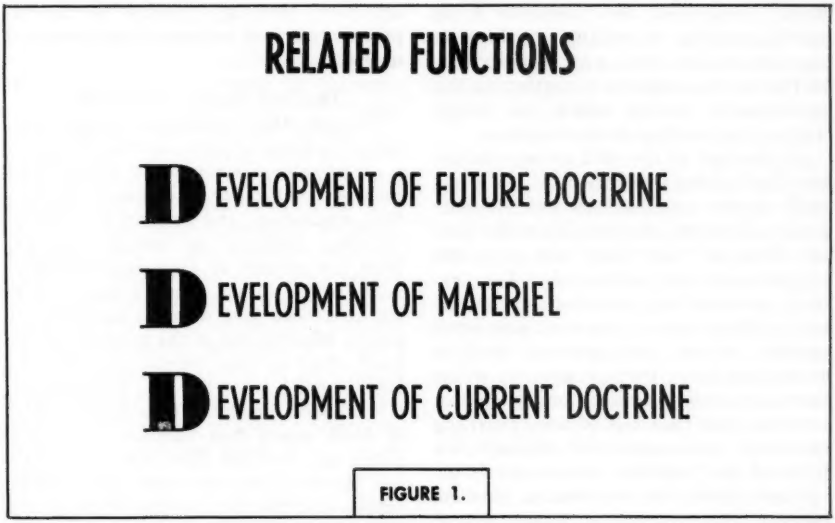


FIGURE 1.

* The Haworth Committee—Dr. Leland Haworth, President, Brookhaven National Laboratory, Chairman—was appointed in 1954 by Secretary of the Army Stevens to review the Army Combat Developments Program.

XUM

This evaluation concluded that the Army's doctrinal effort should be intensified, that attention to long-range problems should be increased, that additional emphasis be placed on joint operations, and that a greater effort be made to guide rather than be guided by technological developments. It further concluded that the direction and coordination of the system should be strengthened and improved. Finally, although acknowledging the benefits of a vertical or functional organization, these studies, specifically the Haworth Report, recognized the invaluable Army assets available in existing development agencies of the arms and services and, therefore, recommended strengthening this developments system within the framework of the existing Army structure.

At the time of the 1955 reorganization, the Chief of the Department of the Army staff agency for Research and Development of Materiel was elevated to the Deputy Chief of Staff level with functions including primary responsibility for planning, coordinating, directing, and supervising Army materiel research and development. Actual developmental work is carried out by or through agencies of the various technical services or by civilian contract, with the Chief of R&D generally exercising his supervision through the Chief of the Technical Service involved.

Responsibility for the Combat Developments—"idea branch"—or development of future doctrine on the other hand, was assigned to the Commanding General, United States Continental Army Command, under the staff supervision of the Deputy Chief of Staff for Operations, Department of the Army. Under current implementing regulations, his mission consists of two closely interrelated tasks —*current doctrine* (training literature) and *future doctrine* (combat developments)—each accomplished by a separate but interrelated system. Thus CG USCONARC is responsible for initiation of new concepts, qualitative materiel requirements and military characteristics representing the user, the Army in the Field, as well as being responsible for the preparation of training literature for the employment of new materiel when developed by R&D.

This is the seventeenth in a series of articles expanding various aspects of "USA Command and General Staff College Keeps Pace With the Future," written by Major General Lionel C. McGarr, USA, Commandant of the College, and published in the April 1957 issue of the MILITARY REVIEW.—*Editor.*

The Dual Nature of Doctrine

The first task, training literature, provides the means of ensuring that the Army is doctrinally combat ready today. This requires continuous and timely production, evaluation, and revision of current doctrinal material to include concepts from the present to approximately three years in the future. Here, a major problem is to keep pace with the technician to ensure effective use of the products of the R&D effort as they become available. At USCONARC, as at the DA, this program is a staff responsibility of a Deputy Chief of Staff whose field includes operations, plans, and training. The principal operating agencies are the arms and service schools and the two colleges of the Army Educational System in coordination with the Army in the Field. In this respect combat arms schools and the colleges are under the command of USCONARC, while the technical and administrative service schools are responsible to their respective technical service chiefs but coordinated in certain doctrinal areas by USCONARC.

The second element of the over-all USCONARC doctrinal mission is future doctrine or combat developments or as General Bruce C. Clarke sums it up, "developing organizations, tactics, and tools that will

XUM

enable the son of today's soldier to take the objective in the future." This, naturally, requires systematic analysis, study and development of concepts projected forward into long-range time spans to anticipate changing battlefield conditions and requirements. Then, through creative thought, experience and user oriented judgment, the operational and administrative support concepts for the future, together with their accompanying materiel requirements, are developed. At USCONARC, this program is a staff responsibility of the Deputy Chief of Staff for Combat Developments. For the combat arms, the principal USCONARC operating agencies are the combat developments departments or sections of the combat arms schools, while the two colleges are charged with the combined arms and services and joint aspects of the mission. For the technical and administrative services, again the operating components are agencies designated by each such service which, although under their respective service chiefs, are coordinated by USCONARC in regard to CD work for the Army in the Field. In addition, USCONARC has a DCS for Materiel who has no counterpart within the Army Service Schools. He supervises writing of military characteristics and monitors the work of its service test boards. Figure 2 (page 12) depicts the organizational relationships established for doctrinal and materiel developments.

Actually, doctrinal work is the *sum* of both current doctrine (training literature) and future doctrine (combat developments) and *both systems must operate within a common set of long-range objectives and be mutually supporting.* Current doctrine which is not forward-looking is as unsound as future doctrine which exceeds the practical, projected state of the Art. The end product of combat developments—organizations, operational-logistical concepts, and hardware requirements —continuously becomes the basis for training literature (current doctrine). *Therefore, close integration of the two systems is essential.* Since both doctrinal programs (future and current) and service school instruction must mesh with R&D to ensure that training literature, trained officer personnel, and new materiel arrive in the field concurrently, *the complex relationships and high degree of required coordination becomes clearly apparent.* Figure 3 (page 13) further illustrates the interrelationships and phasing involved in the interacting programs.

As shown, the cycle begins with the initiation of concepts or objectives and develops until it is consummated by effective integration into the Army of the end products—new doctrine, new organizations, and new materiel. There are actually two leadtimes in *addition* to that normally accepted as present in the R&D phase. These must be recognized and taken into account as both impact heavily on the over-all program. The first occurs within the combat developments phase as "pre-R&D leadtime" and constitutes that gap between the birth of an idea and the initiation of materiel development necessary to its realization. The second occurs during the training literature phase as "post-R&D leadtime" and represents the timelag between the completed development of an item of hardware and final DA approval of supporting doctrine for its employment.

Where We Stand Today

Since 1955 much has been accomplished in both the doctrinal and materiel fields. New divisional organizations fully adaptable to continued modernization have been adopted, each with its organic nuclear delivery means. Army aviation units of varying types have been developed, activated, and equipped and significant improvement in VTOL and STOL aircraft are in sight in the immediate future. A new series of missile commands has been deployed to

XUM

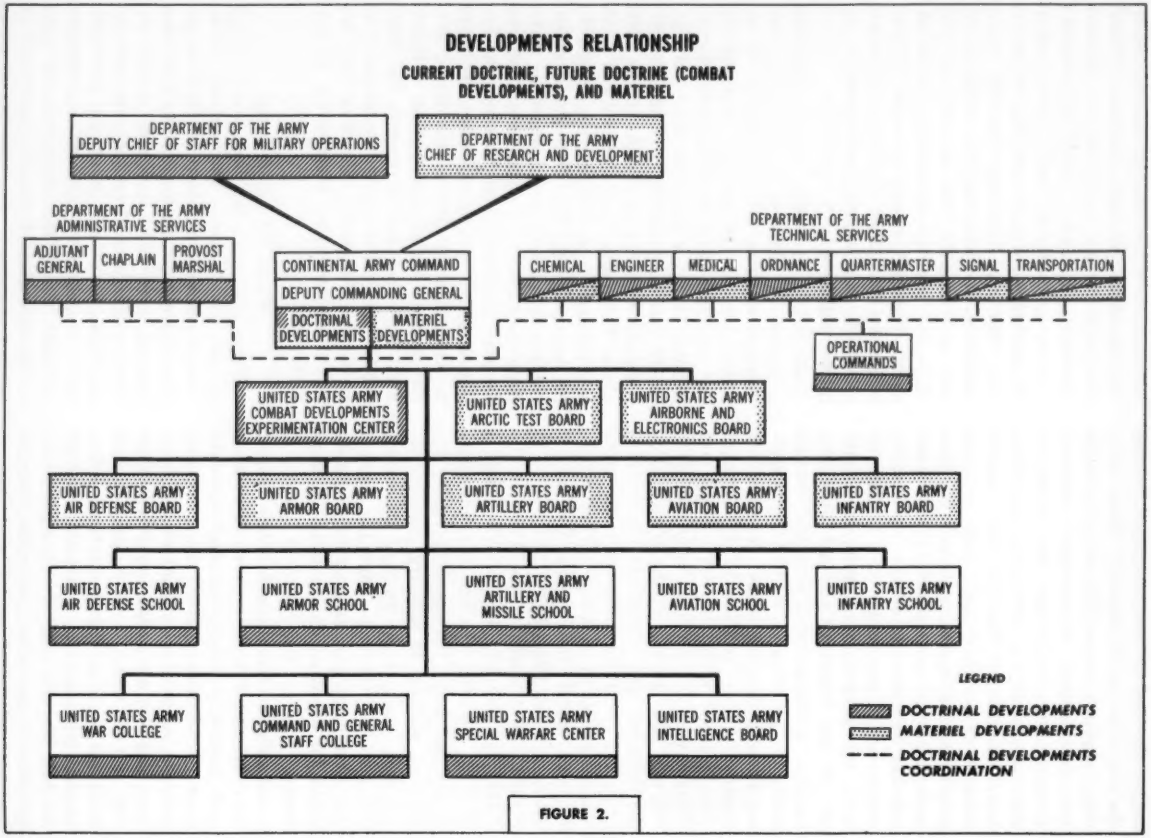

DEVELOPMENTS RELATIONSHIP
CURRENT DOCTRINE, FUTURE DOCTRINE (COMBAT DEVELOPMENTS), AND MATERIEL
DEPARTMENT OF THE ARMY DEPUTY CHIEF OF STAFF FOR MILITARY OPERATIONS
DEPARTMENT OF THE ARMY CHIEF OF RESEARCH AND DEVELOPMENT
DEPARTMENT OF THE ARMY ADMINISTRATIVE SERVICES
ADJUTANT GENERAL
CHAPLAIN
PROVOST MARSHAL
CONTINENTAL ARMY COMMAND
DEPUTY COMMANDING GENERAL
DOCTRINAL DEVELOPMENTS
MATERIEL DEVELOPMENTS
DEPARTMENT OF THE ARMY TECHNICAL SERVICES
CHEMICAL
ENGINEER
MEDICAL
ORDNANCE
QUARTERMASTER
SIGNAL
TRANSPORTATION
OPERATIONAL COMMANDS
UNITED STATES ARMY COMBAT DEVELOPMENTS EXPERIMENTATION CENTER
UNITED STATES ARMY ARCTIC TEST BOARD
UNITED STATES ARMY AIRBORNE AND ELECTRONICS BOARD
UNITED STATES ARMY AIR DEFENSE BOARD
UNITED STATES ARMY ARMOR BOARD
UNITED STATES ARMY ARTILLERY BOARD
UNITED STATES ARMY AVIATION BOARD
UNITED STATES ARMY INFANTRY BOARD
UNITED STATES ARMY AIR DEFENSE SCHOOL
UNITED STATES ARMY ARMOR SCHOOL
UNITED STATES ARMY ARTILLERY AND MISSILE SCHOOL
UNITED STATES ARMY AVIATION SCHOOL
UNITED STATES ARMY INFANTRY SCHOOL
UNITED STATES ARMY WAR COLLEGE
UNITED STATES ARMY COMMAND AND GENERAL STAFF COLLEGE
UNITED STATES ARMY SPECIAL WARFARE CENTER
UNITED STATES ARMY INTELLIGENCE BOARD
LEGEND
DOCTRINAL DEVELOPMENTS
MATERIEL DEVELOPMENTS
DOCTRINAL DEVELOPMENTS COORDINATION

FIGURE 2.

XUM

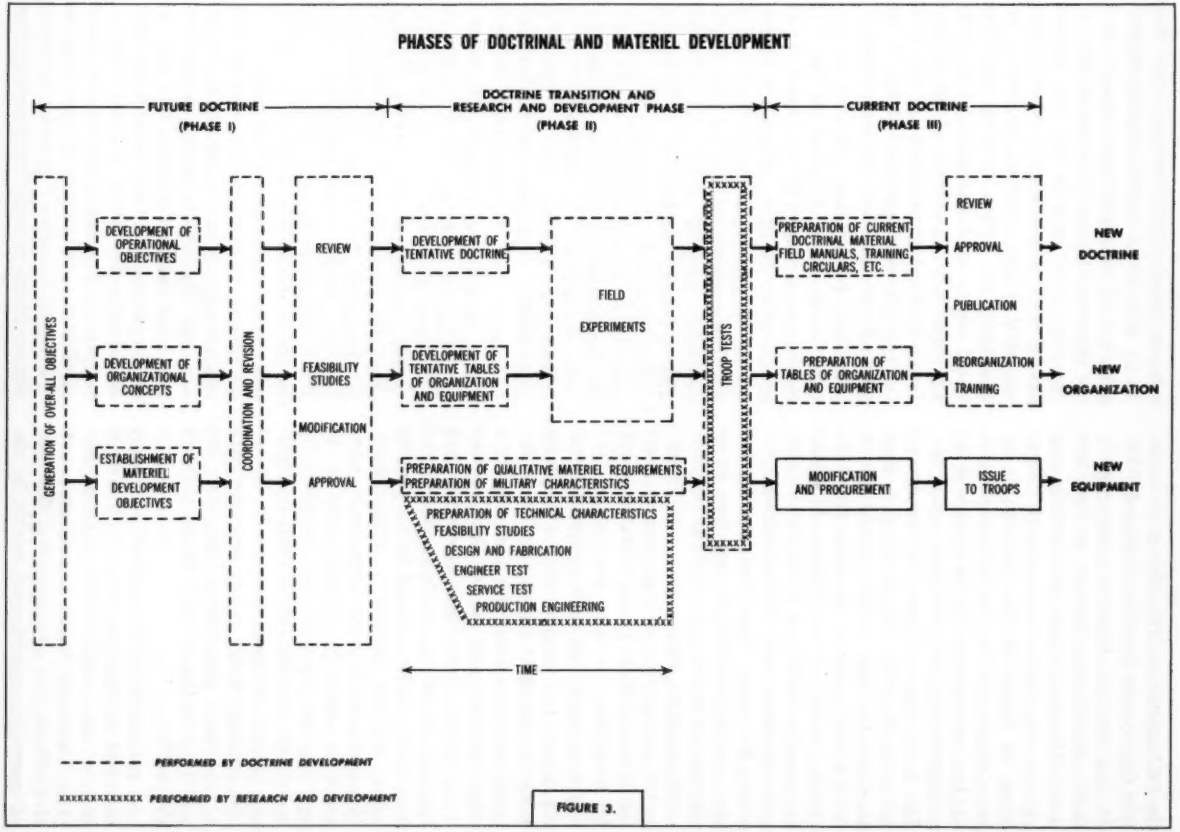

PHASES OF DOCTRINAL AND MATERIEL DEVELOPMENT
FUTURE DOCTRINE
(PHASE I)
DOCTRINE TRANSITION AND RESEARCH AND DEVELOPMENT PHASE
(PHASE II)
CURRENT DOCTRINE
(PHASE III)
GENERATION OF OVER-ALL OBJECTIVES
DEVELOPMENT OF OPERATIONAL OBJECTIVES
DEVELOPMENT OF ORGANIZATIONAL CONCEPTS
ESTABLISHMENT OF MATERIEL DEVELOPMENT OBJECTIVES
COORDINATION AND REVISION
REVIEW
FEASIBILITY STUDIES
MODIFICATION
APPROVAL
DEVELOPMENT OF TENTATIVE DOCTRINE
DEVELOPMENT OF TENTATIVE TABLES OF ORGANIZATION AND EQUIPMENT
PREPARATION OF QUALITATIVE MATERIEL REQUIREMENTS
PREPARATION OF MILITARY CHARACTERISTICS
PREPARATION OF TECHNICAL CHARACTERISTICS
FEASIBILITY STUDIES
DESIGN AND FABRICATION
ENGINEER TEST
SERVICE TEST
PRODUCTION ENGINEERING
FIELD EXPERIMENTS
TROOP TESTS
PREPARATION OF CURRENT DOCTRINAL MATERIAL FIELD MANUALS, TRAINING CIRCULARS, ETC.
PREPARATION OF TABLES OF ORGANIZATION AND EQUIPMENT
MODIFICATION AND PROCUREMENT
REVIEW
APPROVAL
PUBLICATION
REORGANIZATION
TRAINING
ISSUE TO TROOPS
NEW DOCTRINE
NEW ORGANIZATION
NEW EQUIPMENT
TIME
PERFORMED BY DOCTRINE DEVELOPMENT
PERFORMED BY RESEARCH AND DEVELOPMENT

FIGURE 3.

the field and the doctrine for their battlefield employment has been developed. STRAC has come into being as a strategically mobile worldwide deterrent to the Communist threat of limited and possibly even general war, and a long list of "Army firsts" to include the first nuclear air defense missile and the first US space satellite has been inscribed in the history of the nuclear-missile and dawning space age. This is but a partial record of the Army's advances. However, the doctrinal worker, as well as the R&D worker, should keep in mind that progress in weapons and space vehicles is only in its infancy. Also that technological advances never cease; each accomplishment inevitably encourages another. We must, therefore, ensure that past accomplishments do not lead us to rest on our laurels. Our doctrine and materiel programs must continue to be subjected to objective scrutiny and no stone left unturned in the ever-continuing search for progress.

For example, although progress is being made, the Army needs a quantum jump in battlefield mobility to bring mobility back into some measure of balance with the firepower of tactical nuclear weapons—to close the increasing gap between conventional surface mobility and that which can be provided by air vehicles which are now technically within reach. *Even more the Army-at-large needs to improve its capability to adapt itself to the new concepts involved.* Also urgently required are smaller—much smaller—tactical nuclear weapons for use in limited war, weapons which can be employed with a reasonable expectation that their use would not be the cause of an extension of the conflict.

A realistic principle applicable to Army doctrinal development is that both tactical doctrine and administrative support doctrine (including logistics, personnel, and civil affairs) are so interrelated that one, of necessity, cannot realistically be developed independently of the other. The Army as a whole must recognize the importance of administrative support and the inseparability and interdependence of operations and logistics. For this reason, the Army's developmental efforts must ensure that every tactical advance is accompanied by forward-looking organizational, operational and materiel concepts for administrative support of the tactical forces involved. Improvement in this area demands the best continued efforts of the whole Army—not just the logistician.

Another fundamental principle of doctrinal development is based on the fact that wars are fought by integrated teams of the three Services, as required, fighting on the ground, in the air, and on the sea. Consequently, Army doctrine is inextricably involved with joint doctrine. The increasing employment of joint and unified commands should naturally be accompanied by corresponding emphasis on the development of improved concepts for their operations. The excellent working relationships and physical proximity of USCONARC, Headquarters Tactical Air Command, and Headquarters Atlantic Fleet, have brought about considerable progress in this area. Yet a number of significant divergencies of a decade ago remain unresolved. It appears that at times the basic defense structure itself tends to place the Services in competition for roles, missions, and supporting funds. When this happens it, of course, impacts on the over-all defense effort to include doctrinal development. While some Service overlap and competition can be considered healthy and necessary to ensure adequate "strength in depth" of organizations and weapons systems, this must be on a controlled and coordinated basis which is subordinated to the over-all needs of the Nation. The Army, for its part, recognizes that most aspects of joint doctrine are beyond the control of a single Service, and continues to work for doctrinal agen-

XUM

cies and liaison with the inherent capability to foster and reach solutions.

As noted above, another facet of joint operations affecting doctrinal work at the College level has to do with the properly tailored forces with which each Service contributes in important ways to all major military operations. For example, massive nuclear retaliation currently is based primarily on Air Force capabilities teamed with the Navy's carrier-based bombers, while Army forces fight the land battle. However, the required deterrent force for limited wars must be based primarily on the divisions of the Army and Marine Corps *supported* by tactical air forces, carrier forces, and strategic air and sea lift. For the purpose of developing the Army aspects of joint doctrine, it is necessary to determine the optimum participating forces of the Services and their roles. Considering the capabilities of each service as an entity is, of course, not sufficient. Rather it is necessary to know the available, coordinated contributions of all services. General Taylor pointed up this problem in testimony before a congressional committee:

I think that our weakness is in not determining standards of sufficiency—how much is enough . . . for all of those categories to which several Services contribute. We never look at the problem horizontally and determine whether each function is properly supported by the appropriate forces of all contributing Services.

Certainly the best interests of the Nation are served by effective Tri-Service teamwork and soundly developed joint doctrine—both present and future—based on the tailored force, horizontal method of analysis. This principle of measuring and exploiting the inherent special capabilities and characteristics of each member of the Tri-Service team is analogous to the long-standing combined arms and services *approach* and has definite application to analytical Army doctrinal work for the Arms and Services.

While future doctrine sets the goal for the scientist, there is another related fundamental which should guide our thinking. Within the service school or college, post-R&D leadtime—the period of preparation of doctrine and instruction—must be minimized by drafting doctrine concurrently with the development of the new hardware and taking a calculated risk that the end product of the R&D effort will adequately approximate the assumed characteristics. In addition, the service school today can keep abreast of new materiel development only if it "anticipates" developments in its area of interest on a continuing basis, and initiates doctrinal study and exploratory instruction well in advance. A case in point is the recent development of a small, lightweight, nuclear weapons system suitable for integration into the lower tactical echelons. The actual development came as a technological breakthrough but the realization that such weapons would eventually be available could well have been logically assumed and advanced planning initiated—especially by the responsible Army colleges and combat development agencies.

As indicated previously, the end product of the current doctrine effort is, of course, timely training literature placed in the hands of troops. This is the primary means of communicating the result of our doctrinal efforts to the user in the field. With the current rate of technological advance, new field manuals frequently are outdated by organizational changes and new weapons faster than they can be written, coordinated, reviewed, and published. In fact, today the useful life of a major field manual is considerably less than when the present training literature procedures were devised. As the rate of doctrinal change cannot be expected to level off, but probably will continue to increase at a geometrical rate, imagina-

XUM

tive thinking is required on the part of all concerned to solve this problem. *Here again, a key element is time—lateness is synonymous with obsolescence.* In the over-all production process, much of the timelag is consumed in consecutive, detailed reviews—a procedural holdover from the days when the race against time was not so critical. The probability that doctrinal requirements will continue to multiply without a corresponding increase in resources makes it imperative that optimum organization and management procedures be utilized to increase the volume and speed of production of the system's end product.

For the most part, the factors previously considered concern only the tangibles of organization, procedures, and techniques of the current doctrine and CD systems. Important as these are, they are but the framework within which the systems operate. *The mind of man remains the motivating force* and his *power of thought* determines the *quality* of the product upon which our success or failure in the continuing struggle with imperialistic communism will depend.

The challenges to our mental ability are many and varied. With the high price of modern military hardware, we cannot ignore cost in any field. As General Bruce C. Clarke has said, "In research and development we must be selective in stating our requirements so we are not priced out of existence." Avoiding this pitfall requires the type of thinking and careful selection which will ensure that resources are directed into those areas where significant and essential advances in Army capabilities can be attained at acceptable cost.

Even an unlimited budget, however, would not diminish the requirement for progressive thought. No matter how much is expended on hardware and research in response to the tactician's stated requirements, there is no assurance of an immediate advance comparable to that achieved by the Manhattan Project. *Consequently, we must continually strive for a doctrinal breakthrough* in concepts for arranging *combinations* of existing weapons systems and ideas into *new* patterns of effectiveness. The political-military-economic factors employed by the Communists as a cold war tactic demonstrate the value of such combinations—many of which are not primarily dependent on hardware. Our search, too, must recognize the possibilities that are open to us and make full use of the vast array of power forms *currently* in our armory—nuclear energy, air vehicles, electronics and electronic countermeasures, chemical and biological weapons to include psycho-chemicals and psychology—without losing sight of exotic new devices in the nature of magnetic force, rays and space vehicles which are already conceivable.

The various leadtimes inherent in the phases of the development cycle have been mentioned previously. However, there is another, even more critical—the "between the ears leadtime" that precedes an idea. It can be reduced only through the most vigorous and forward-oriented leadership at all echelons. Until it *is* reduced to the absolute minimum, we can never optimize the effectiveness of our existing arsenal much less keep the "hot breath" of the user on the neck of the scientist where it belongs.

USA CGSC Doctrinal Approach

Measures taken by the College to adjust its current doctrine and combat developments organization to the nuclear-missile age have been described in previous *Military Review* articles of the "Keeping Pace" series and will be only briefly summarized here. In this respect, it should be kept in mind that changes applicable for one agency may not necessarily be desirable at other echelons. Of course, comparable improvements have been made at

XUM

other service schools and other levels in the Army.

Leavenworth is assigned a key role among the service schools as a result of the scope of its doctrinal-instructional mission. This mission encompasses to a significant degree the Army in the Field to include tactics, logistics, and joint aspects at the combined arms and services level. Combined arms and services doctrine developed by the College provides the framework for doctrine produced by the arms and services schools. As a result, higher headquarters has traditionally staffed the College with outstanding officers of all branches of the service, who as a group have a wide range of knowledge and experience with respect to the Army in the Field.

To meet the challenge of the present pace of technology, the College doctrinal effort was reorganized two and one-half years ago to include the provision of both a Chief of Doctrine and a Chief of Combat Developments with the former having responsibility for current doctrine *and for over-all coordination* of College current doctrine and combat developments (future doctrine) work. This dual responsibility of the Chief of Doctrine achieves maximum utilization of time and manpower resources and results in a more cohesive, integrated doctrinal product. Concurrently, the Instructional Departments have been organized more functionally to provide *cohesive doctrinal-instructional areas* and, in addition, a *doctrinal element* has been established in *each* of these departments. Similarly the College combat developments resources were combined in a single new Department of Combat Developments which is part of the worldwide USCONARC CD system. The Chief of Combat Developments is both a staff officer and the Chief of this department.

Added emphasis was also given the combined arms and services *approach*, widening the range of skill and experience represented on the Faculty and use of an expanded Faculty Board for the review of doctrine. To better fulfill the College tri-service responsibilities, a joint operations doctrinal-instructional section was organized and staffed by outstanding officers of all the Armed Services. Areas requiring emphasis and special concentration such as logistics, air mobility, unconventional warfare, and air defense were represented organizationally in the College. In order to improve doctrinal coordination and management, the timeframe distinction between current doctrine and combat developments was also reexamined and more clearly delineated.

Following basic organizational and management principles of unity of effort, grouping of homogeneous functions, and successive delegation of authority has enabled the College to speed up internal coordination, reduce leadtimes, and generate and exploit promising ideas and concepts without over-all loss of control. Additionally, the integration of related activities ensures the combined arms and services point of view in the development of doctrine which blends the separate skills and capabilities of all branches and services to create an integrated fighting team.

And so—the search for improvement continues.

Summary

Unlike hardware, man is the one element in the military inventory which is irreplaceable. This is because he has been endowed by our Maker with the power of rational thought and consequently must be reconditioned and used again and again. The products of this thought, however, such as concepts, systems, and plans, wear out and *do* need replacement. Therefore, these products must not be accepted as dogma nor allowed to become ingrown with habit and tradition to the point that they become deterrents to new and better ideas. Research indicates that about one in every four people can think creatively;

XUM

however, most can be taught to think logically and objectively. *Our survival as a great Nation depends on the quality of our ideas* in competition with those of the Soviets—and our ability to convince the world of the validity of these ideas. What is needed even more than land, sea, air, or even industrial power, is *brain power* —brain power coupled with the will and determination to work and sacrifice for a *national purpose* in which we wholeheartedly believe! The Army has its purpose—*continuous* readiness for *sustained* combat—readiness for the nuclear or nonnuclear battlefields of the future, or for the arena of unconventional warfare. To attain this purpose to the fullest extent possible within the tactical framework dictated by National policy and its supporting strategy, *the Army must further tap the tremendous thought potential available at its grass roots level.* This requires more than a purely mechanical approach. It requires *flexibility of mind and creative thinking* by dedicated men imbued with the spirit of progress—and the determination to achieve the required results. Albert Einstein's remarks, "imagination is more important than knowledge," highlights the need for *imagination* in creative thinking. The College is convinced that this applies with special force to all engaged in doctrinal work.

Until further important technological breakthroughs occur, the job of doctrinal development is twofold. First, we must mold new and effective "combinations" of present and projected weapons and weapons systems and their supporting organizations to ensure optimum user oriented results. These new "conceptual" combinations must move in the direction of greater tactical and strategic mobility with the "air cushion type" vehicle concept being employed on a universal scale; missiles being used for administrative support of farflung battle groups to include both materiel deliveries and personnel replacement and reinforcement; improved flying platforms, "saucers," to provide mobility for battle group type units which while allowing the use of terrain for protection will not limit mobility; and, finally, the *full* military use of space. With technological breakthroughs in harnessing magnetic force, ultrasonic vibrations, and ray type energy in the foreseeable future, a whole new series of "combinations" becomes possible. *We must be doctrinally prepared!* This highlights the second important mission of doctrinal development —drawing up the blueprint for future concepts and organizations which will maximize insofar as possible the results of preplanned technological advance. We, the users, must ensure that *the scientist is guided into those areas where successful research will produce optimum increases* in Army mobility, communications, weapons systems, and the use of human resources.

Just as greatly improved firepower and mobility have placed tactics in the realm formerly occupied exclusively by strategy, the shape of the *tactical warfare* of the future will to an even greater degree be dictated by National policy and its supporting Military strategy. The tactician of the future must be more capable and well-grounded than his predecessor and must be fully prepared to adapt his course of action to conform to the over-all National strategy—be it general war, limited war, situations short of war, or some lesser shade of cold war. Equally as important, he must have the *mental flexibility* to change from nonnuclear to nuclear warfare in the middle of a battle—if required. Above all we must not allow our tactical and strategic concepts to be unduly limited by rigid military conditions such as terrain, scale of use of nuclear weapons, or specific types of war. This requires flexible concepts and organizations readily adaptable to ensuring successful operations under any environment

XUM

which National strategy dictates. Greater cognizance needs to be taken of the flexible mobility required to support National policy and to ensure a defense posture capable of countering the many-sided Communist threat. Strategically mobile, integrated, and balanced components of the Army-Navy-Air Force must constitute a mutually supporting "deterrent team"—a team on which the Army, as an important member, is armed with tactical nuclear weapons and is able to fight a "modernized" conventional as well as a nuclear war. There must be no chink in our armor for keeping the pace.

The general public must be made fully aware of the complex and continuing nature of the threat which is not merely military in character. An enlightened public opinion is essential to understand, resist, and defeat Soviet cold war "talk tactics" which consist of various combinations of power politics, exaggerated claims, politically inspired cultural programs, missile blackmail, slanted literature, political subversion, historical distortion, propaganda, state controlled education, counterfeit economic assistance, and even religion. Of course, our country is becoming more and more aware of this Soviet tactic, especially at the conference table which has become an extension of the battlefield, with propaganda and concessions as the objective. This is the stuff of which the Soviet non-military, cold war weapons systems are fashioned and which we must counter if freedom is to survive.

What the mind of man can conceive, he can accomplish. He must follow his *ideals* and *ideas* as beacons into space—beyond the known confines of our galaxy to the unknown outer reaches of the universe itself—if he is to fulfill his destiny and exploit fully his God given power of Thought!

The human obstinately resists change of any sort but particularly an effort to change his mental raiment—the trousers of convention, the vest of doctrine, the coat of dogma, and the all-enveloping mantle of tradition. Man has a mind that can reason, but he uses it primarily—almost exclusively—to buttress the opinions, prejudices, and minor faiths he has unthinkingly absorbed from his environment. This he incorrectly calls *thinking*. The right name is rationalizing.

—Major John H. Burns
"The Dead Hand" (1937)

XUM

Political-Military Consultation Among Allies

Dr. David F. Trask

ONE of the most important consequences of America's rise to world power since 1898 has been our participation in international military coalitions. Our 19th century wars with Britain, Mexico, and Spain were fought without external assistance, but in this century we have waged two World Wars within alliances. Today, we depend primarily on a complicated system of alliances to avert war. Consequently, we need to improve our knowledge of the problems encountered by military coalitions as they plan and execute joint policy and strategy.

The United States now bases her national defense on the conviction that war can be avoided by creating and sustaining massive deterrent power. We have chosen to organize and exert our power largely through regional alliance structures. Among these are the North Atlantic Treaty Organization, the Rio Pact, the Anzus Pact, the Southeast Asia Treaty Organization, and the Middle East Treaty Organization. In addition, we have bilateral defense treaties with several nations in East Asia—the Philippines, South Korea, Nationalist China, and Japan—and special military arrangements with many other countries.

Political-military cooperation with other nations is thus a central national concern. We must harmonize our particular political aims and military strategy with those of numerous allies. Moreover, we must be sure that the political-military objectives we pursue within a given alliance like NATO do not conflict with the objectives of our other alliances. Each of our alliances must be flexible; each must be sensitive to changes in the internal relationships of the member nations and to changes in the external situations it seeks to stabilize.

The difficulties encountered by the United States while participating in military coalitions during the two World Wars—not to mention the dilemmas posed by our current alliances—reflect not only the inherent complexities of international politics but also the national lack of experience in such arrangements. Military officers necessarily participate in the decision-making process of the armed coalitions to which the United States adheres. The Military Establishment should be particularly conversant with the categories of problems usually posed by interallied negotiations. We must now emphasize, as never before, the political education of the officer in the highest sense of the term, especially to equip him for dealings with allies.

Historical Record

The historical record contributes a great deal to our understanding of the nature of military coalitions. Our minds turn naturally to the lesson inherent in Thucyd-

Political-military cooperation with other nations is a central national concern. Participation in international military coalitions has been one of the most important consequences of America's rise to world power

ides' account of the Peloponnesian War. The Athenian failure to take full advantage of the power possessed by their allies contributed most significantly to the Spartan victory. Napoleon habitually took advantage of opportunities to divide the military coalitions directed against him and thus to conquer them in detail. It is said that Bonaparte actually preferred to engage coalitions rather than individual nations, because the difficulties of interallied cooperation ultimately proved a source of weakness in his opposition.

One word of warning should be given: a study of the past never completely suffices to solve new problems. A total surrender to tradition might well result in tragic consequences. This is particularly true in an age when military science is undergoing revolutionary change. World War I commanders inherited from the past a profound faith in mass and a relative underestimation of the power of defense. They failed to realize that the development of excellent artillery and rapid-fire weapons required fundamental changes in tactics. The result was enormous and unnecessary carnage.

Similarly, commanders during World War II at first overemphasized the power of defense and underestimated the new offensive power contributed by military aircraft and armor. Until new tactics were developed to accord with the growth of offensive power, land formations suffered excessive losses. We avoid such tragedies by modifying the lessons of the past in the light of new developments. The absolute necessity of assessing the present and future capabilities of nuclear weaponry, space warfare, and associated "revolutions" cannot be overstressed in a consideration of policy and strategy.

When dealing with strategy it is never superfluous to reiterate another truism—military decision-making should be viewed not simply as a means of ensuring military supremacy but also, and more importantly, as a means of achieving *political ends*. Nations whose military leaders do not recognize the primacy of this concept face the prospect of internal civil-military confusion and conflict. The primacy of civilian leadership over military leadership is an effective safeguard, but we should understand that our strategy might well be injured if the military completely abjures consideration of the political consequences of their acts. Of course, the possibility of civil-military controversy is particularly great in a democracy if the citizenry does not understand that wars are fought specifically to attain political ends. Our recent experience offers a good example. Because the tradition of "unconditional surrender" has been so important in American history, both civilians and soldiers have found it difficult to recognize that sometimes a total military victory might well be incompatible with the political ends for which a given war is waged.

The political issues which lead to wars are external reflections of underlying socioeconomic tensions. Obviously, one cannot resolve political controversies without considering their underlying causes. Moreover, the political divisions *within* as well as *between* coalitions stem from these fundamental sources. This article deals specifically with the nature of the political-military negotiations made necessary by participation in alliances, taking for granted the existence of underlying tensions which must never be neglected. The "total" nature of modern warfare—

Dr. David F. Trask enlisted in the Army in 1952 and was commissioned a second lieutenant the following year. He was separated from active duty in 1954 after service as Assistant S3 of an infantry regiment at Fort Rucker, Alabama. From October 1954 to July 1958 he was with the 94th Infantry Division (USAR) as aide-de-camp. He received his Ph. D. from Harvard University and presently is an instructor in history at Wesleyan University, Middletown, Connecticut.

XUM

whether "hot" or "cold"—makes this fact more central than ever before. No statesman or soldier who participates in the making of interallied policy and strategy can afford to ignore it.

Political Purpose of War

Nations in coalition coordinate policy and strategy on two levels. First, each nation individually develops its war aims and plans a strategy specifically calculated to implement them. Second, the several nations jointly determine the over-all policy and strategy of the coalition. This task obviously is complicated by almost inevitable differences among the allies. Allies rarely wage war against a common enemy for exactly the same reasons. Because their political purposes vary in some detail, their strategic conceptions also vary to an extent. The coordinated political-military effort of an alliance seeks to harmonize a complex of sometimes inconsistent and often contradictory political purposes. This variation in purpose is rooted in underlying cultural, social, and economic tensions. Thus interallied agreement often is extremely difficult to arrange.

Of course, there are other sources of potential disunity. Linguistic difficulties, logistical problems, and military jealousies immediately come to mind as probable apples of discord. Also, honest differences of opinion tend to occur—even when a fundamental political unity exists—but these problems usually are more easily resolved than political questions. Our experiences during the two World Wars illustrate these generalizations very well.

The United States entered World War I primarily to achieve a postwar settlement which would ensure the future against autocracy and war. Our "Associates," the Entente Powers, fought primarily to arrange a postwar settlement involving territorial acquisitions and assurances of security against their enemies. Some of the Entente objectives clashed with the war aims embodied in President Wilson's Fourteen Points and associated pronouncements. Naturally, interallied disagreements over strategy developed during the course of the war. Different political aims suggest different strategies. Such things as choice of theater, disposition of resources, and timing of operations depend largely on the ultimate political purposes which are being served by the war.

One of the most interesting controversies of World War I erupted after the Bolsheviks overthrew the moderate Kerenski regime in Russia in November 1917 and made a separate peace with the Central Powers about four months later. The French became alienated from the Bolsheviks, among other reasons, by the Russian repudiation of huge debts contracted in France by the Czarist regime. The British feared the prospect that Russo-German cooperation might facilitate a German penetration into South Asia. Consequently, the British and French leaders interested themselves in several military operations designed to restore the shattered Eastern Front. The Germans had taken advantage of the cessation of hostilities in the east to transfer many veteran divisions to France in preparation for a huge spring offensive. The French and the British argued that a revival of military operations in Russia would lessen the political tension created by the Bolshevik coup and also hinder the German reinforcement of their armies in France.

The United States at first steadfastly opposed such proposals, not only because they seemed militarily impractical but also because President Wilson did not want to prejudice the chances for a rational postwar settlement. He feared his prestige as tribune of the coming peace might suffer if it could be charged that the United States had interfered in the internal affairs of Russia. After a pro-

XUM

longed controversy, the President finally was forced to approve the dispatch of severely limited interallied expeditions to Eastern Siberia (Vladivostok) and Northern Russia (Murmansk-Archangel) in which Americans took part.

World War II offers equally striking examples. Famous disagreements centered around the decision to concentrate first on the destruction of Germany before subduing the Japanese. Another steaming controversy erupted from the decision to assault Germany across the English Channel rather than through the "soft underbelly of Europe." In both instances differing political intentions as well as purely military estimates of the situation influenced the advocates of the several schemes. Often these disputes are kept from the public and only publicized long after the event when the leaders recount them in print.

The discussions aroused by the publication of the memoirs of World War II leaders like Eisenhower, Bradley, Stimson, Churchill, Alanbrooke, and Montgomery remind historians of similar disputes following World War I when the memoirs and diaries of leaders such as Sir Henry Wilson, Lloyd George, Clemenceau, Foch, House, and Pershing appeared in the bookstores. The irony of these exchanges derives from the fact that more effective interallied coordination would have restricted the number and importance of such struggles.

These illustrations indicate the tensions which may arise when nations in alliance advocate conflicting strategies due to divergencies in their political aims or their estimates of the military situation. If these tensions cannot be prevented, they at least can be minimized by efficient consultative methods.

World War I

The United States accumulated considerable experience with military coalitions during the two World Wars. Much more should be known about this exposure. The natural and certainly laudable desire of the American people to seek peace and avoid war has had some unfortunate consequences. Our hatred of war has caused us to be remiss in studying our wars in order to enhance the prospect of avoiding future conflicts. Since our national approach to the threat of aggression now is to deter potential enemies by marshaling our own power and that of our allies in regional defense organizations and other special arrangements, the lessons of past interallied experiences become peculiarly relevant to the present.

During the last year of World War I the United States participated in an interallied organization called the "Supreme War Council," set up to coordinate the policy and strategy of the western coalition. This organization was established by a gathering of Entente soldiers and statesmen at Rapallo, Italy, in November 1917. During the previous year the Western Powers had sustained a series of political and military disasters, among them the failure of huge offensives against the German line in France, the rout of the Italian Army at Caporetto, the devastations of unrestricted submarine warfare, and the defection of Russia. The only favorable portent for the Entente Powers was the entry into the war of the United States. At the root of the disasters of 1917 had been the failure to coordinate interallied policy and strategy. This task was assigned to the Supreme War Council.

The Council included the Head of Government and one other political representative from each participating nation. The members were Britain, France, Italy, and the United States. Associated with the Council was a board of "Permanent Military Representatives" composed of one distinguished soldier from each member nation. This group possessed advisory powers only, and it gave professional military counsel to the Supreme War Council.

XUM

The Council met regularly, usually at Versailles, during 1918 until the armistice. It discussed proposals brought forward by its several participants. The Permanent Military Representatives were particularly diligent in their advisory duties. President Wilson was technically the American member of the Council, but he never participated personally in its deliberations. On two occasions he was represented by Mr. Edward M. House; otherwise the United States did not seat a political delegate. The American Military Representative was the distinguished ex-Chief of Staff, General Tasker H. Bliss, whose services at Versailles merit the greatest attention and respect.

Achievements and Weaknesses

Although the Supreme War Council has been largely passed over by historians of World War I, its activities profoundly influenced the coordination of interallied policy and strategy during the decisive stage of the conflict. The institution never attained maturity, but even with the disadvantage of late organization it established a remarkable record. The very fact that it brought together the Entente Premiers—Lloyd George, Clemenceau, and Orlando—on regular occasions (along with their principal political and military advisors) for the purpose of concerting policy and strategy is in itself of great significance. The Council was the medium through which the Allies finally arranged the unified command of Marshal Foch. It conducted the climactic negotiations in Paris in late October-early November 1918 which produced the political and military terms of the armistice accepted by Germany. Less theatrical but of a similar order of importance were the decisions made by the Council in connection with the allocation of manpower and materials. Because historians are inclined to center their studies on controversial subjects, they have tended to neglect the effect of the relatively successful interallied cooperation which was at the root of the great victories achieved in 1918.

If certain weaknesses in its organization had been corrected, the Council might well have accomplished much more than it actually did. In particular, its relations with theater commanders remained unclear, and its Military Representatives were not closely enough associated with the general staffs and command echelons of their respective countries. In addition, the Council failed to take adequate account of naval strategy. This task was delegated to a separate institution, the Allied Naval Council. Naval operations would have been improved if they had been more closely coordinated with land operations by the Supreme War Council on the basis of advice from a group of naval experts with tasks similar to those of the Permanent Military Representatives.

American participation in the activities of the Supreme War Council reflected the fundamental decisions on national policy and strategy made during 1917 by the President and his advisors. We entered the war without striking prior political bargains with the Entente Powers and without well-developed mobilization blueprints and strategic plans. We continued to avoid political discussions of war aims with the Entente Powers, but we energetically proceeded to develop and coordinate national policy and strategy.

US Policy

Our *policy* during the period of belligerency was to work for a peace settlement designed to end wars. To gain this end the President gradually visualized a league of nations based on the principle of collective security rather than on balance of power. Wilson avoided public comments on war aims until early in 1918. He feared a public debate might stimulate divisive controversies at a time when unity was essential—at a time when all-out interallied military cooperation was required

XUM

in order to stem the final offensive actions of the German Army in France. During 1918 our military power increased, and the Entente Powers became increasingly dependent on American assistance. The President believed these developments provided an opportunity to make speeches on war aims and marshal world opinion in favor of American plans. His most important pronouncement was his address on the Fourteen Points of 8 January 1918. He followed this *démarche* with his Four Principles of 11 February 1918 and his Five Particulars of 27 September 1918. These "Twenty-Three Points" summarized American war aims in relatively concrete terms.

At the heart of the American plans was a league of nations. The American program was planned and announced unilaterally without prior consultation with the Entente Powers. The President thought consultation would force him to make unacceptable compromises. He believed the victory over the Central Powers would allow him, if necessary, to impose the American program on both the conquered and the conquerors.

In order to create the political conditions in which his program could be adopted, the President and his advisors saw that Germany would have to be defeated decisively in the field. In order to attain this end our *strategy* was to train and employ an independent American Army to be concentrated on the Western Front against the German Army. The American Army would occupy its own sector and operate under its own commanders. This strategy led to American opposition to interallied plans involving national commitments in other theaters. Our naval contribution was to aid and abet all-out efforts to destroy the effectiveness of the German submarines. Thus our strategy was directly related and subordinated to our policy.

Since our fundamental approach to interallied cooperation was to encourage a maximum of military coordination consistent with a fixed intention to maintain diplomatic freedom of action, the American participation in the Supreme War Council emphasized military cooperation and minimized political discussion. This principle governed the decision to send General Bliss to Versailles as the American Military Representative but to avoid the dispatch of a political representative to sit on the Council. The American estimate of the situation proved highly accurate. Adequate military cooperation was achieved. The United States avoided entangling diplomatic agreements which might have prejudiced the chances for a Wilsonian peace. Germany was decisively defeated in the field.

At this point the United States sent a political representative, Colonel Edward M. House, to the Supreme War Council in order to secure an armistice agreement based on the Fourteen Points and associated war aims. House took part in the prearmistice negotiations conducted by the Supreme War Council and, after a hard struggle, gained Entente acceptance of the Fourteen Points. (Previously, the President had conducted independent negotiations with the Central Powers and obtained their consent to the American terms.)

To summarize, the United States Government recognized the necessity of cooperating extensively with its associates during World War I but controlled its interallied relationships remarkably well, thus managing to achieve both its political and strategic objectives in 1918. The *wisdom* of President Wilson's peace plans is not under discussion here. The argument here is that our strategy and our cooperation with the Entente Powers during the period of belligerency were carefully planned and executed in order to create the conditions which gave the President an opportunity to control the postwar settlement. In general, strategy was

XUM

properly associated with policy. We never lost sight of the need to judge strategic proposals in terms of the contribution they would make to the fulfillment of ultimate political aims, however practical or impractical those aims might have been.

There is no attempt here to comment on the *wisdom* of our strategy. The point emphasized is that the *relation* between policy and strategy, given the fact that the nation was participating in a coalition, was fundamentally sound. Our power, relative to that of the Entente, enabled us to avoid unnecessary political compromises during the period of belligerency without unduly weakening interallied unity and military cooperation.

World War II

During World War II the nation once again encountered the twin problems of developing national policy and strategy and concerting plans with those of Great Britain and the USSR, the other members of the Grand Alliance. Once again the coalition established interallied institutions for the purpose of coordinating interallied policy and strategy. World War II was a much different kind of conflict than World War I. It was much more nearly a "total" and "global" war. It was fought to attain different objectives, and it was conducted by a different group of leaders. Military capabilities had been revolutionized. Moreover, the group of war aims known as the Atlantic Charter had the effect of coordinating interallied policy (at least to some extent) *prior* to the American entry into the struggle. Relationships between Britain and the United States were very good, but the USSR remained a very difficult ally throughout the war. A knowledge of these conditions helps us to understand the organization and functions of the institutions created during World War II to coordinate interallied policy and strategy.

The fundamental interallied decisions of the war were made during gatherings of Heads of Government held at widely separated places—Washington, Quebec, Casablanca, Teheran, Cairo, and Yalta. The principal participants, of course, were Prime Minister Churchill, President Roosevelt, and Premier Stalin (present only at Teheran and Yalta). The political leaders received competent military and naval advice from the interallied institution known as the Combined Chiefs of Staff Committee (CCS). It was composed of the chiefs of staff for land, sea, and air forces of the British and American Governments. The Russians did not sit on the CCS; their representatives met with the Anglo-American group when Stalin was present. Thus these "summit meetings" accomplished tasks analogous to those of the Supreme War Council in 1918, and the Combined Chiefs of Staff Committee performed functions parallel to those of the board of Permanent Military Representatives.

There were, however, many differences; the arrangements of World War II corrected some of the defects which had hampered interallied cooperation during World War I. The CCS had much greater executive authority than the Permanent Military Representatives. It served as a super-GHQ—a composite commander in chief of Anglo-American forces throughout the world. Lack of command authority had seriously restricted the efficiency and prestige of the Permanent Military Representatives. The mistake of separating the military advisory group from the general staffs of individual nations was not repeated. Moreover, naval, air, and land operations were considered jointly, thus contributing to the coordination of the several arms.

It is difficult to imagine the chaos which would have prevailed without the unifying direction imparted by interallied consultation carried on at the periodic "summit conferences" and CCS meetings. (The CCS met regularly in Washington between

top-level conferences.) Controversies of greater or lesser significance certainly troubled the waters, but the inherent sufficiency of these interallied institutions managed to soften the divisive effects of such disagreements and to resolve many of them.

Just as during World War I, the American relation to interallied institutions reflected the nature of national policy and strategy. Our *policy* was to prepare the way for a postwar political settlement based on an international collective security arrangement. Our *strategy* was to defeat the Axis Powers decisively—first in Europe and then in Asia—in order to create the conditions which would allow us to gain our political objectives. These fundamental purposes had to be preserved despite the strains imposed by the need to coordinate our military effort with nations pursuing somewhat differing purposes.

President Roosevelt was far more interested in the details of strategy than was President Wilson. Roosevelt worked closely with his professional military and naval advisors, and his personal influence and participation profoundly affected American decisions. Paradoxically—despite the pervasive leadership of the President—the American approach both to national political-military coordination and to interallied consultation during World War II tended strongly to emphasize immediate military concerns at the expense of ultimate political aims. Military rather than political considerations deeply influenced American planning and negotiations with the other members of the anti-Fascist coalition. Strategic decisions of the United States took primarily into consideration the total defeat of the Axis Powers without adequate consideration of the probable political resultants of the strategic plan. This state of affairs contrasts strongly with the methods followed during World War I.

To some extent this difference was imposed, among other things, by the "total" nature of World War II and the character of our relations with the USSR. President Roosevelt's approach to interallied consultation and agreement reflected his determination to maintain close cooperation with Great Britain and effective assistance to the Russians. He hoped thereby to avoid wartime ideological and political conflicts (which might have divided the anti-Fascist coalition hopelessly) by concentrating attention on the strictly military program required to destroy the Axis Powers. The touchstone of American dealings with the British and the Russians was the probable military resultant of a given strategic plan rather than its ultimate political ramifications. Nowhere was this approach more evident than at Yalta. Stalin agreed to enter the war against Japan after the defeat of Germany in return for territorial concessions in the Far East. It is ironical that "secret diplomacy" should be blamed by those who disagree with the Yalta decisions for what in actuality was primarily an action influenced by military interests rather than political aims.

To summarize, interallied consultation during World War II proceeded with remarkable efficiency, considering the indubitable complexities of the situation. However it seems fair to conclude that interallied strategy during World War II might have been influenced more consciously by our national political aims without unduly interfering with victory.

Conclusion

In an age when one of our most important concerns is the quality of our political-military planning—both national and international—the need to study and comprehend the problems associated with participation in alliances should be obvious. The tragedy already wrought by two World Wars plus the advent of nuclear

XUM

weaponry compells us to recognize that a third war is unthinkable. The efficiency of our *interallied* deterrent power will determine to a large extent whether or not we can avoid the inconceivable devastation which would result from the tremendous firepower of modern formations, despite new defensive techniques which will be developed.

The urgency of the situation only increases the necessity of mutual understanding and cooperation between the United States and her allies. The efficiency of institutions like the NATO Council and the NATO Staff reveals a new level of sophistication in interallied cooperation, but present circumstances require even better arrangements in the future. Military men face an important challenge. The quality of their participation in the establishment of interallied institutions and in interallied decision making will have a profound effect on the outcome of future crises. Benjamin Franklin's sage advice to his revolutionary compatriots—"we had better hang together or we will hang separately"—takes on new significance in our troubled times.

It is impossible to talk about our own military might without taking into account the strengths of our Free World allies. The two are inseparable; each is dependent on the other.

* * * * * * *

I believe it is time we all recognized the facts of life in the world today. All of us have heard, almost to the point of boredom, statements about the shortening of time and distance with modern speed of communication and travel. And yet we apparently have not recognized what these thoughts mean in terms of our own national policy. The space between nations—space on which this country relied for so many years—has lost its significance. Once a fire that broke out in a defenseless nation could be left to burn itself out in isolation; today, it may easily ignite the whole world if it is not quickly brought under control and extinguished.

Our national policy of collective security developed as a result of the new world in which we lived following two World Wars. We recognized that isolated security was no longer a practical possibility. We moved toward collective security and toward a program designed to strengthen our Allies. . . .

Secretary of Defense Neil H. McElroy

Body Armor: How It Worked

Captain Roger W. Little, *Medical Service Corps*
3d Medical Battalion, 3d Infantry Division

THE suggestion to add eight pounds to the basic load of the rifleman probably would not be received by him with wild acclaim. However, when those eight pounds conceivably could increase his prospects of battlefield survival, the proposal deserves a second look.

The eight pounds in question is the weight of the nylon armored vest—by the end of the Korean War a standard item of equipment. Strangely—it seems now—the armored vest initially was a dud on the military market. It was rejected originally as too cumbersome, inadequately protective, and "psychologically" undesirable. Yet a cautiously accepted experiment brought forward one of the most treasured possessions of the rifleman in Korea.

How did it work? The answer has been available in medical literature for over four years. The results were reported in full by Lieutenant Colonel Robert Holmes, Medical Corps, in the *Journal of the American Medical Association* in August 1954. However, they have not been published for the use of the commanders and combat men who are most intimately concerned with their use. This article attempts to bring together these data and thoughts about the armored vest, and to project its place in future combat.

Related Questions

There are three related questions as to how well the vest worked. First, how did it stand up against enemy fire, and did it accomplish the job for which it was designed? These are questions of *efficiency*. Second, how *effective* was the vest in keeping men in the fight and winning the battle—for this, after all, is the final measure of any new combat development? And third, *what more can be done*, besides inventing new equipment, to save the lives of combat men?

The vest was *efficient*. In the data reported by Colonel Holmes, a total of 184 vests were examined carefully after being worn during a test period. Each vest had been hit by an average of four shell fragments, two small arms missiles, and four additional objects which could not be classified.

What happened to the shell fragments? More than three of every four—76 percent—were stopped by the vest, and possibly fatal or serious wounds prevented. Even the one fragment of every four that *did* get through, had to pass through a formidable barrier at a considerable cost in velocity and probable impact effect. Result: no wound at all, or a less serious wound than would have been expected without the vest.

Small arms missiles were not as easily stopped. In fact, the ratio of defeated (stopped) to penetrating missiles was almost exactly the reverse of shell fragments. Out of every four small arms missiles, one was stopped by the vest while the remaining three passed on through. It can be assumed, however, that the vest

Conservation of fighting strength will be of increasing importance in future warfare. Body armor, combined with effective first aid measures and prompt evacuation from the battlefield, will minimize casualty losses

XUM

affected even the perforating small arms missiles in the same way as it did the shell fragments from artillery, mortars, and grenades—presenting a strong, impact-absorbing barrier before the missile reached human tissue.

From the viewpoint of *efficiency*, then, and in answer to the question of how well the vest resisted enemy missiles, body armor passed the test. Its success is measured by a record of stopping 68 percent of all missiles (three times as many shell fragments as small arms missiles), while slowing down 32 percent.

Ultimate Test

The next question was one of *effectiveness*. The ultimate test of any equipment development is the contribution that it makes toward winning the battle. In the medical mission this means the degree to which it helps to conserve fighting strength. For this answer it is necessary to go back to the original medical statistics which were used to justify adoption of the vest. Detailed studies had been made earlier of types of wounds, the body regions in which wounds had been sustained, and the types and characteristics of the wounding missiles.

First, it was known that three of every four wounds (or 75 percent) were caused by shell fragments rather than small arms fire. Thus wounding was more likely to result from being in the wrong place at the wrong time, rather than of being shot at by an aimed weapon. Chance played a major part in the combat wounds caused by shell fragments. If these chances could be brought under control or reduced in effect, a fundamental step in wound prevention would have been taken. It would follow that while stopping shell fragments, anything used as a barrier would have the side—or incidental—effect of slowing down or absorbing a major proportion of the impact of even small arms missiles.

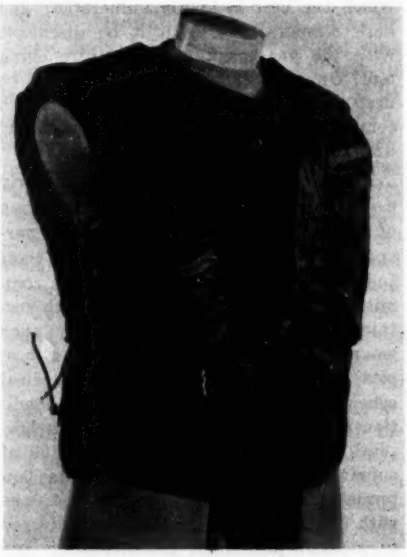
A second critical factor was revealed through an examination of casualty statistics. Seventy percent of the wounds from shell fragments only "penetrated" the body, rather than "perforating" it and passing all the way through. That is, at the time of impact, the missile must have been traveling at such a low rate of speed that the body tissues could absorb the shock (although often with severe damage) and retain the missile. This finding indicated that if the body itself could stop seven out of every 10 wounding missiles, the degree of protection required in a protective garment was smaller than had been anticipated. The combat soldier could be well-protected (although not completely) against his most random and undiscriminating enemy—the flying fragments—at only a slight cost in weight and reduced mobility. However, the loss of mobility would be more than offset by the number and condition of men left to *be* mobile.

The final determinant in the design of the armored vest was drawn from studies indicating the most vulnerable body regions. It was clear that the thorax or chest, and abdomen, were the areas of the body most exposed (excluding the head, the only body area previously protected). Of every 100 men hit, it could be predicted that 41 would incur wounds in these areas. More important, however,

---

Captain Roger W. Little served as a communications officer with the 94th Division in Europe during World War II. He was separated from the Army in 1946 and returned to active duty in 1949 as a social work officer with the Mental Hygiene Clinic, 3d Armored Division, Fort Knox, Kentucky. In 1951 he was assigned to the Mental Hygiene Consultation Service, 7th Armored Division, Camp Roberts, California. From 1952 until 1957 he was assigned as sociologist with the Neuropsychiatry Division, Walter Reed Army Institute of Research, conducting field research in Korea and Japan. He is now in Germany with the 3d Medical Battalion, 3d Infantry Division, as a social work officer.

from the viewpoint of battlefield mortality, the thorax and trunk were the areas in which almost half (46 percent) of all *fatal* wounds occurred, either when killed in action or after the wounded had reached hospitals. Thus from the viewpoint of vulnerability to wounding, and survival after wounding, the thorax and abdomen were



Armored vest

the most important areas to be considered for protection.

With these facts in mind the specifications for the vest were then established. It should stop primarily shell fragments that would, without armor, penetrate the body but not pass through, in the region of the thorax and abdomen. And this it did.

Test Results

When the test period was completed and the results surveyed, the findings were as follows. Of every 100 men who were previously killed or died because of wounds, 46 would have been wounded in the thorax or abdomen. When the same number of men wore the vest only 32 incurred fatal wounds in that area; a net saving of life —14 men.

The known effect of the vest was slightly less among the wounded in action, because those who might have been wounded by missiles which were completely stopped by the vest never were countable. Of the original 100 men, 30 would have been wounded in the unprotected area without the vest. With the vest only 20 were wounded, a net saving of 10 men.

These results are enough to give every combat man a big chunk of confidence. But there is another side to the evidence, one that should be examined with equal care and understood by all who use or deal with the armored vest.

Qualifying Considerations

First, the vest does not make the combat man invulnerable to enemy fire, even in the protected body areas. Well over half of those wearing body armor incurred multiple wounds, including some wounds in unprotected areas. There was little change in the frequency with which men were wounded by small arms fire when wearing the vest as compared with those not wearing it. The vest did not change the relative proportions of killed in action to wounded in action (one to four), a ratio that has remained stable since the Civil War. The implication is clear: the vest is a good thing to have, but it is no substitute for good cover and concealment.

Second, the vest was not intended to be equally effective against all missiles. It worked best against shell fragments—as was expected. Against small arms missiles its most important effect was to establish a delaying and velocity-reducing barrier. Legends of supermen demolishing enemy machinegun nests while protected by the vest probably have little basis in

fact. Machinegun bullets will penetrate the vest, especially at close range. The circulation of such legends is likely to cause more trouble than create confidence. No more should be expected of the vest than is built into it. It *did* reduce the chances of incurring a fatal or severe wound in the most vulnerable region of the body.

Third, the psychological value of the vest can be overestimated. In most cases it will assure the soldier that his chances of being killed or seriously wounded have been reduced. But it is doubtful that it will have a "tonic effect," and make the passive soldier more aggressive. It was designed to fit the *normal* risks of battle. If wearing it is used as a justification for increasing the risks of combat, it may have precisely the reverse effect. Troops will become increasingly "wound sensitive." Then the odds *against* safety will be considered more frequently than the simple capacity of the armor to stop *some types* of missiles.

Proponents of the view that the vest will act as a tonic may point to the contrast between body regions in which wounds were incurred before and after body armor. Statistics show that there are *relatively* more extremity wounds with armor. But this is purely a statistical artifact. Wounds in the protected regions—chest and abdomen—declined by 11 percent. This 11 percent has merely been reallocated to upper extremities (increased three percent) and lower extremities (increased eight percent). That is, if 100 wounded are counted, and those who would have been wounded in the protected regions are no longer among them, their share of the percentage will go to the other categories. So this, at least, is not evidence that the vest-clad soldier was more aggressive.

Acceptability

Finally, as a culture object, the armored vest will tend to take on the meanings associated with the period in which it was introduced. In Korea this was, of course, a stabilized defensive warfare in relatively open although mountainous terrain. It is yet to be determined how men will react to an added eight-pound load (which holds heat) in situations calling for long marches, prolonged attacks, or in jungle warfare against sniper fire (to which the vest is highly vulnerable) and high temperatures. Will it be discarded with the gas mask and the intrenching tool? Only this much is certain: it will be used or neglected in the degree to which combat men understand its purpose and limitations. It should not be oversold.

The results of the vest are most clearly evident in studies of groups rather than of individual instances—which is the perspective most persons use in making their judgments. Of several men who are committed to combat, it can be said with certainty that *more* will incur only such wounds that can be evacuated to a hospital or treated at a forward medical echelon. If they still are in such a condition that they can be evacuated to a hospital, their chances are 98 out of 100 of surviving. Military medicine now has approached the limits of what can be done with the wounded *after* they are delivered to medical personnel. Improvements and additions of armor to other body regions will only help to prevent wounds.

There still is a danger that the armored vest will be thought of as a new gadget which promises an ideal and simple solution to a complex problem. The greatest loss in human life in warfare still occurs *on the battlefield*, including both those who are killed in action immediately, and those who die of wounds before adequate medical care can reach them. Although less than World War II, the battlefield mortality rate was higher in the Korean conflict than in World War I. The number of wounded men by both shell fragments and small arms missiles is increasing.

This situation will have even more serious implications when considered from the expected tactical disposition of nuclear warfare.

Other Methods

What can be done besides gadgeteering? The task of caring for the wounded is stretching the capacity of the medical personnel. Lieutenant Colonel Douglas Lindsay, Medical Corps, when with the Army Medical Service Board, stated that almost one out of every four men left on the battlefield as killed in action could be saved by more efficient *forward* medical service organization and training. He contended that many men who are listed as "killed in action" are not killed instantly. The evidence indicates that their deaths are caused by wounds in the trunk or extremities which need not have been fatal except that the aid man was not present or was rushed with other casualties. Meanwhile, *the wounded man or his buddies lacked the training to apply some immediate emergency medical care.* If this one man in every four is to be saved, the individual soldier must learn much of the aid man's current knowledge, and be able to use it quickly. The aid man must learn more of the techniques of the unit surgeon: the demands on his knowledge, skill, and ingenuity are being vastly increased.

Finally, commanders must become increasingly aware of the medical aspects of the fight. Traditionally, the subject of the killed and wounded has been a delicate one, so fraught with moral and emotional implications that it has been considered largely a medical problem. This can no longer be so. The medical aspect of every fight will be a crucial one in survival as well as victory. Replacements will be more difficult to obtain. The unit surgeon and his teams of aid men will be recognized for what they have long been: a primary motivating symbol for the combat man, indicating the best that medical science has to offer to the most forward echelons. In the past their skills have been spread too thin; now and in the future everyone must share the task of saving the dying and of evacuating the wounded.

This may do more than any "gadget" for the solidarity of the combat echelon. There is no man more important than the rifleman's buddy. There are few limits on what they will do for one another. And there is no measure for the motivation that is generated when both know that if one is knocked out, everything possible will be done to save him—by buddies, the medical service, and the commander himself. This knowledge may provide a bigger and more lasting piece of armor than the eight-pound nylon vest. Both are essentials in conserving the fighting strength.

Let us always view the ground combat soldier in proper perspective. 'The Man Behind the Gun' is still a very effective slogan, but it can bear some analysis. It implies that we send a gun against the enemy—and send along a man. This may be true of a tank or a bomber or a battleship crew. But 'Man Behind the Gun' infers much more:

That regardless of sophistication, no weapon or tool of war appears on the battlefield unaccompanied by MAN!

True, MAN may be in remote control. But 'remote' is a scientific refinement; 'control' is a natural truth. MAN *is* behind the gun—from conception through refinement to obsolescence. MAN produces the weapon. MAN retains full responsibility for its use. We must never lose sight of the fact that the weapon does not use the man—MAN uses the weapon. Thus to accomplish the Army's unique mission, we do not man the arm—we arm the MAN.

General Bruce C. Clarke

ONLY THE BEST GO NORTH

Major Frank B. Case, *Transportation Corps*
Headquarters, United States Army, Alaska

ON 18 October 1955, twenty-seven officers and men, with five tractors and three *Weasels*, set out on the longest cargo hauling operation ever attempted on the Greenland Icecap. The commander reported:

By the time the swing reached Mile 350 there was only about two hours of daylight each day. The altitude increased continuously and the temperature became lower and lower. Personnel had difficulty with head coverings and eyelashes freezing from condensed breath. Flashlight batteries lasted for about 20 minutes in the extreme cold; Weasel *tracks cracked; fuel lines, fuel filters, and wet cell storage batteries froze. Tractors failed constantly. The weasels could not be kept running and it was necessary to use a tractor for trail reconnaissance.*

The party returned to base 60 days later after a 1,320-mile running battle with the polar winter. Operating for weeks in temperatures between 50 and 60 degrees below zero, whipped by Arctic blizzards at 10,000 feet above sea level, they had delivered a payload 660 miles from base and returned through the 24-hour darkness of the long Arctic night. A generation earlier, the exploit would have earned world headlines. In 1955 and today, such operations are routine missions in the Army program to develop a fighting capability in the northernmost reaches of the Western Hemisphere as far as possible from the industrial complexes of Canada and the United States.

Soviet Activity

For two generations before 1952, the United States came close to forfeiting the Arctic to the Soviet Union. With thousands of miles of coastline on the Arctic Ocean, Russia has been active in polar exploration since the 17th century. In 1918 Lenin authorized organization of an Arctic Ocean hydrographic expedition, and in 1937 the Soviet Union began an aggressive program of air-supported research in the Arctic Ocean Basin which continued through the war and has been accelerated in recent years. Since the advent of the missile age, dozens of missile stations have been built on the Arctic coast of Siberia and on the offshore islands facing the Western Hemisphere over the shortest route from the east.

In the West, polar exploration traditionally has been the province of private initiative. Only since the establishment of the *Icecap* Research Project in 1952 has the United States supported a sustained polar development program. Today, an active competition in polar scientific development exists between the United States and the Soviet Union. As the scientific efforts on both sides are supported by constantly improved equipment and procedures, the basic capabilities that will be needed to support future military operations are developed. The prize in this coldest of cold wars is a commanding position in global strategy.

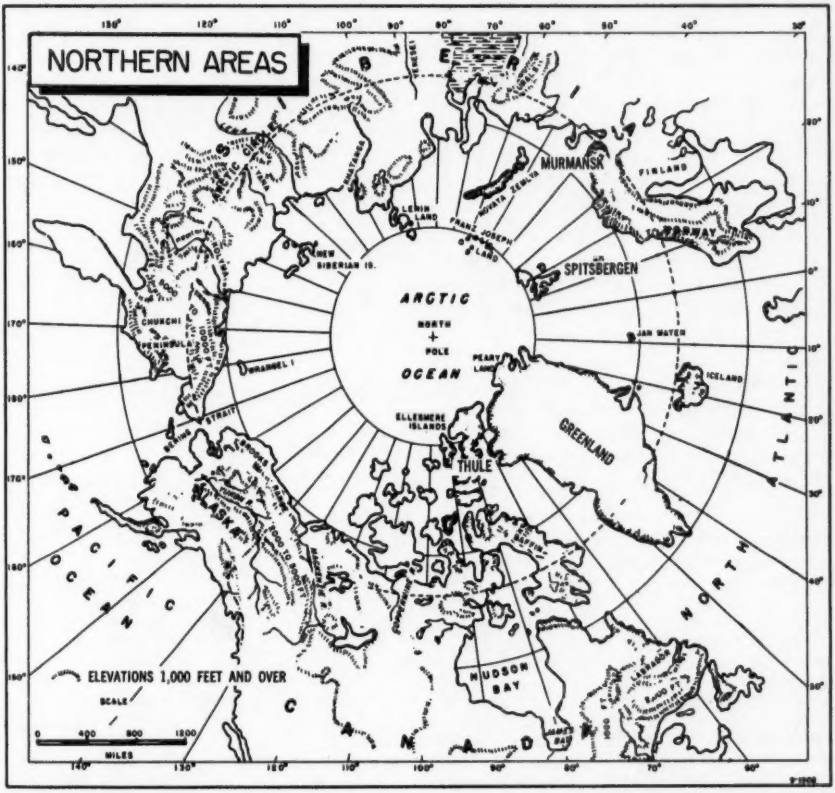
The geographic advantage in the polar

Although many problems and much of the mystery of far north operations have been solved, many difficulties and challenges still must be overcome if successful military operations are to be carried out in that region

regions lies with the West. While most of the Eastern Hemisphere above the Arctic Circle consists of frozen ocean, on the other side of the world the Arctic Archipelago of Canada and the great island of Greenland thrust upward to within little more than 300 miles of the North Pole. Siberia, Greenland has a position in the Western Hemisphere which is unmatched by any in the Eastern Hemisphere.

Research Initiated

In 1952 the US Army Transportation Corps initiated a research program to de-



Greenland is situated on the Great Circle routes from Russian Arctic bases to the northeastern industrial United States. Thule stands approximately 1,900 miles from Murmansk. The east coast of Greenland is 600 miles nearer Russia and only 350 miles from Spitsbergen. As an intercept base for aircraft and missiles from

velop the logistical basis for an Army fighting capability in this strategic region. Sustained ground combat depends upon surface transportation. Therefore, the first objective of the *Icecap* Research Project was creation of a surface movement capability which would support military operations in permanent ice and

snow. Up to 1952, despite the use of light tracked vehicles by postwar exploring and scientific parties in Greenland, surface movement on the icecap and on the frozen surface of the Arctic Ocean was chiefly a dogsled and ski operation. Even today the Danish Sledge Patrol maintains order on the east coast of Greenland with dogsled communications. But modern combat requires the movement of thousands of tons of supplies to the fighting forces and a task of this scope is beyond the capacity of dog teams.

The need for modern equipment for modern support tasks was illustrated during the preparations for the International Geophysical Year program in Antarctica. After a team of Army polar transportation experts had pioneered the trail from Little America to Marie Byrd Land, tractor trains hauled approximately 600 tons of supplies over the 647-mile trail. The job would have required, the "old polar hands" calculated, 70,000 dogs—not counting the 70,000 dogs which would have been required to haul frozen fish to feed the dogs hauling freight!

But in 1952 there was no equipment with which to haul large quantities of supplies over deep snow. In the Transportation Corps' first effort to move over the top of Greenland, a party equipped with construction tractors and 10-ton commercial sleds traveled only 17 miles onto the icecap. There, tractors and sleds bogged down and there they stayed. During the next three years equipment was modified progressively until Articized tractors had tracks four and one-half feet wide and sleds were equipped with skis two feet wide and 14 feet long. This equipment provided a usable movement capability on the basis of which future military operations could be planned. The system was slow and expensive, but each tractor, although it traveled only two miles an hour, could haul 40 tons of freight 40 miles in a day, and a sufficient number of tractors and sleds could support a construction program or a combat operation.

Equipment Development

Meanwhile, development began on equipment which would provide greatly improved movement capabilities in the future. One important experiment in improved icecap mobility was the big-wheeled offroad train, popularly misnamed the "Sno-Train." Each cargo car, equipped with four individually powered wheels mounting pneumatic tires four feet wide and 10 feet high, carries 15 tons of freight. This giant rig hauls railway train-sized loads at 10 miles an hour. The Rolling Fluid Transporter—a device which hauls bulk fuel *inside* giant tires—was developed originally for Arctic use and now is finding wide application in military logistics generally. By carrying the load inside the tires, a towing vehicle can move up to four times as much fuel as it can when carrying the load on the tires. With this type equipment the Army can haul battle groups and their supplies rapidly and safely for long distances across the two-mile-deep snow of Greenland. Arctic operations are no longer limited by dogsled capabilities.

Major Frank B. Case is the author of "Beach Operations Under Missiles and Atomics," "Objective—USA," and "Trains Without Tracks" which appeared in the May 1957, February 1958, and March 1959 issues of the MILITARY REVIEW. *He entered the service in 1941 and was commissioned in 1943. The following year he went to Europe with a harborcraft company and remained there on various duties until 1947. Other assignments include duty with the New York Oversea Supply Agency; the Transportation Section, Korea Communications Zone; and the Terminal and Water Transport Division, Office of the Chief of Transportation. Upon his graduation from the 1958-59 Regular Course of the U. S. Army Command and General Staff College, he was assigned to Headquarters, United States Army, Alaska, with station at Fort Richardson.*

Since 1953 the US Army Corps of Engineers has participated in the *Icecap* Research Project with primary responsibility for scientific studies and development of polar construction techniques. Out of these efforts have come many uses for snow as a construction material. Runways for heavy aircraft have been compacted on the icecap surface. In 1957 an undersnow camp, with facilities for 150 men, was built beneath the icecap surface 200 miles from the nearest ice-free land area. Tunnels in which wheeled vehicles and railways may operate have been designed and constructed experimentally. Since, a few feet below the surface, the temperature stabilizes at a level only a few degrees below freezing, soldiers may live and work in undersnow installations in relative warmth and comfort, unconcerned about gale-force winds and killing cold on the surface.

US Army Photo

Deep covered trenches in the Arctic Icecap are used for building undersnow camps, workshops, laboratories, and storage spaces protected from the weather and accumulating snow. This trench is covered by an arched snow roof erected by blowing processed snow over a temporary frame. After a day or so the snow roof hardens and frame is removed.

In the event of war between the West and the Soviet Union, NATO antiaircraft and antimissile defense facilities can be established in undersnow installations high above the Arctic Circle. Each installation, together with its ground de-

fense forces, will be supported by a logistical facility fully equipped with maintenance and supply areas and all the conveniences of a normal military post. Food will be kept in natural refrigerators and fuel for generators, vehicles, and aircraft will be stored in bulk tanks dug in the snow. Weapons firing sites, defense force assembly areas, and helicopter hangars will be located close to the surface, with control rooms, power stations, quarters, and other activities at lower levels beyond the reach of nuclear blasts.

Life in the undersnow posts will be garrison duty with such special features as steak for breakfast and ice cream three meals a day. But the relative comforts of camp life will be small enough compensation for the occasional bitter fighting against two enemies on the surface—the airborne enemy soldier and the wind-whipped cold that kills both friend and foe.

Hypothetical Battle

Such a battle, between ground defense elements of a Blue Force antimissile installation and a Red Force airborne attack group, might develop along the following lines:

US Army Photo

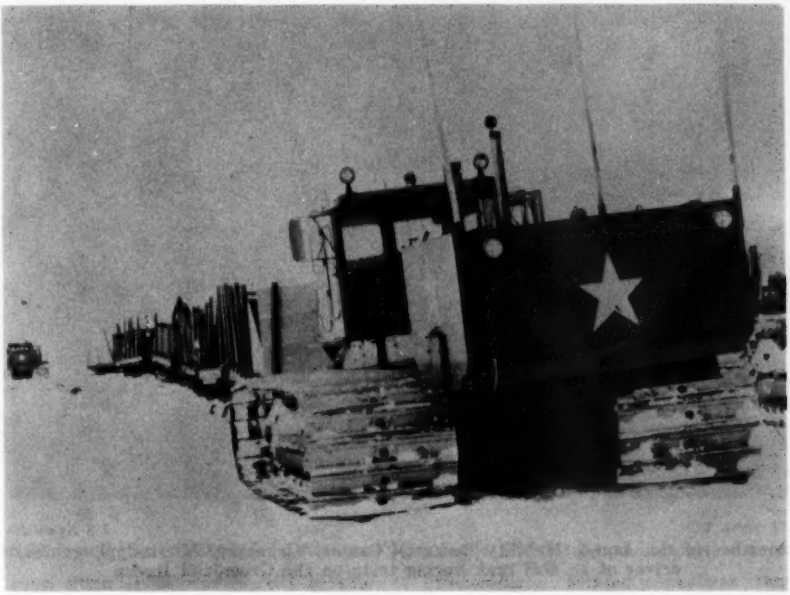
Scientists and technicians from the US Army Snow, Ice, and Permafrost Research Establishment perform on-the-site tests on the properties and structures of snow and ice

The Blue Force Polar Defense Command has been on standby alert for nearly an hour. Technicians operat-

ing Antimissile Station Delta go quietly about their duties deep beneath the surface. Soldiers of the ground defense force are in the squadrooms smoking, reading, and dozing in their bunks. Arctic clothing is piled on the floor close to each man's hand. Individual weapons are already cold-soaked and ready for action in the armored carriers which stand with warmed motors in the assembly area.

roar of motors reechoes off the oil-spattered snow under foot, the walls, and the vaulted roof of glistening ice. The doors of the entry system—dual to provide an airlock to keep out the brutal cold of the surface—swing open together in emergency drill, and the lead vehicles roll toward the ramp and outer darkness.

In a snow cave hangar close by, ski troops have loaded in helicopters



US Army Photo

A tractor train

On the bleak surface 500 miles from the North Pole, the automatic radar sentries, which form the outpost line of the Blue Force installation defense system, detect bogy movements. As the Action Station's gong clangs, men of the ground defense force sprint from squadrooms and dayrooms up the compressed snow passages to the assembly areas. The

which move rapidly to the takeoff pad beneath the overhead hatch. Ground vehicles and helicopterborne elements sweep away to meet the Red Force attack. As the pips of the enemy vehicles appear on the scopes, the Blue Force defenders launch antitank missiles on radar beam control.

The Red Force commander eyes the gray waste of the snow desert grimly,

as the airborne armored carriers of his attack group drift down nearby. Released parachutes whip away on the wind. Already the killing cold is driving through the sides of the command vehicle. The shimmering curtain of the aurora only accentuates the blackness of the polar night.

Weeks ago, plots of Red Force missile interceptions indicated that a Blue Force antimissile station was operating on the icecap. Now, at coordinates where infrared aerial photographs have revealed the presence of man-made structures beneath the snow, the attack group gathers quickly, blinking ready signals. The mission of the group is to ferret out the Blue installation—buried far beneath the reach of air bombardment and missileborne nuclears—to force the Blue defenders to betray the approaches to their base by coming out to fight. Behind the attack group, troop carrier aircraft are sweeping over the Pole with reinforcements to help dig out and destroy the Blue Force installation.

US Army Photo

A member of the Army's Mobility Research Center, Vicksburg, Mississippi, guides the driver of an *M48* tank during tests on the Greenland Icecap

Red Force Attacks

As soon as the attack group is assembled, the Red Force commander moves forward, radiation detectors probing for the nuclear reactor which powers the buried antimissile station, radar searching the surface of the icecap for ground defense activity. The radar operator's voice suddenly crackles with disciplined excitement in the commander's earphones. As Blue Force vehicles appear on his radarscope, the Red commander swings around on a new bearing straight for the point at which the defenders appeared. The Red attack group opens

fire. In the same instant, a Red Force vehicle on the flank disintegrates in flame as a defending missile strikes home.

Without warning the Red Force commander's vehicle tilts sharply as the snow crust sags and collapses. The engine screams for a moment, then stalls as the vehicle slams its nose into the forward wall of a buried snow ditch and drops heavily to the bottom of a manmade crevasse. The commander's warning shouted over the voice communication system comes too late for some of the carriers of the forward screen and, before the advance can be halted, half a dozen vehicles lie helpless in the trap, out of the fight.

Blue Force defenders are slashing at the flanks of the attacking column, their rockets turning enemy carriers into eerie torches in the night. The Red Force second-in-command, improvising rapidly, gathers the remainder of the attack group and turns against the nearest defending element. After a brief fire fight, the defenders withdraw, the Red attack group sweeping after it on an intercept course. Suddenly the leaders among the pursuing carriers crash through the cover over another snow ditch. Red Force second-in-command belatedly realizes that the entire area is crossed by a complex of snow obstacles and that, lacking the key to the complex, he is stymied. He hesitates in confusion and in that moment of delay Blue Force helicopters drop out of the dark sky. Ski troops drag portable weapons onto the snow and, at pointblank range, begin a steady, murderous fire. By twos and threes, the enemy carriers flare, roll to a stop, and stand burning. From a few of them Red

US Army Photo

Drawbar pull of an *M48* tank is measured by using a *Sno-Cat* as an instrument vehicle

soldiers tumble into the snow and flounder away.

Red Force second-in-command estimates his predicament hastily. Can the second assault wave break open the installation if he is still fighting when it arrives? He eases the throttle open and swings the carrier around to run, trying to stay alive long enough to guide in the reinforcements. A sickening lurch, the vehicle totters a moment as he clashes into reverse, then tilts forward and drops. Red Force second-in-command turns slowly to his communicator. "Tell the second wave to go back," he says.

"I think the missiles probably got most of them anyway, sir," says the communicator.

US Navy Photo

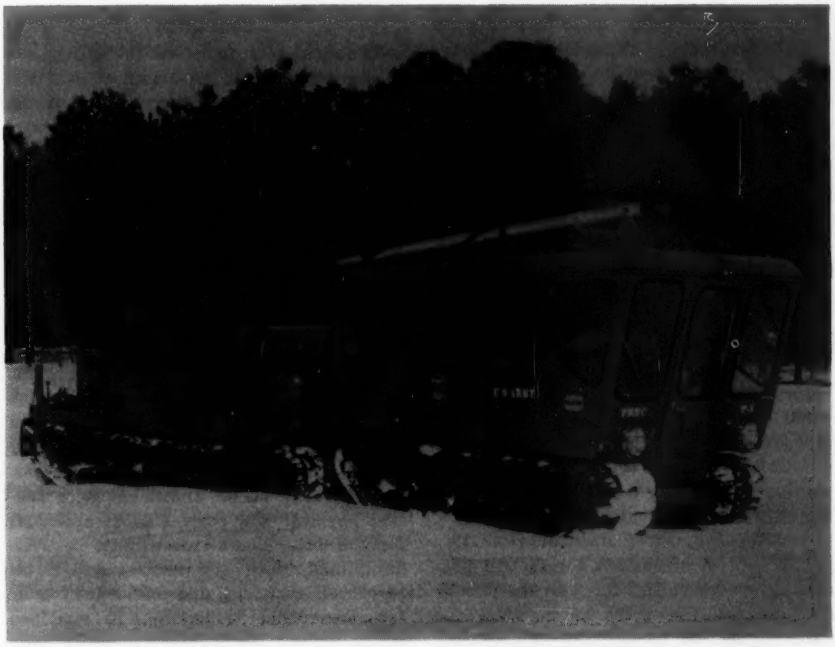
Crevasse detection mounted at forward end of a *Weasel*

Arctic Combat Operations

Ground combat forces must be prepared to defend United States air and missile bases in the polar regions and to neutralize or capture intelligence facilities, logistic installations, and air and missile bases which may be established by the Soviet Union within the vast unoccupied expanses of the Polar Basin and on the coasts of the Arctic Ocean. Ground combat operations in the polar regions will require mobile forces emphasizing maximum firepower with minimum manpower, and special equipment and doctrine. Neither defense nor offense will be able to occupy static positions on the surface for extended periods. Engagements will be short and simple. The defense will have the advantage of operating close to fixed bases and can put men and equipment on the snow surface warm and in good condition. Defensive action must be vigorous and decisive in order to destroy the attacking force before the defender's initial advantage is dissipated.

The offense, fighting both defensive

forces and the environment, must be resolute and ruthless. Strong reserves must be available to press advantages gained by spearhead elements through surprise and hard-hitting attack. Forces committed in the spearhead, even if they are not handled hard by the defense, may be rendered ineffective by the environment



US Army Photo

The *Polecat*, a unique articulated, tandem-tracked dynamometer and instrument vehicle procured by the US Army Transportation Research and Engineering command for use in its mobility research program

before the objective is gained and their replacement after only a few hours fighting may be necessary to sustain the attack. Since there can be no positional warfare on the ice and snow surface of the polar regions, loss of momentum in a polar attack will mean defeat.

The cold and wind will make individual movements unsafe and—worse from the military viewpoint—undependable. Therefore, ski troops, which are valuable in special operations in temperate zone winter warfare, will have only limited usefulness in the polar regions. Infantry elements of combat forces must be motorized, and tactics and equipment modified to permit combat operations to be conducted from personnel carriers which will provide both fighting platforms and environmental protection for the soldiers.

Air Movement

Attacking forces normally will be carried to objective areas by air. Air landings at the objective will be preferable to airdrops but frequently will be imprac-

ticable because cargo aircraft large enough to lift armored personnel carriers will be unable to land on the permanent snow without prepared runways. Paradrops using normal procedures will be impossible. Individual soldiers parachuted into deep snow and gale winds at temperatures on the order of minus 50 degrees Fahrenheit would be so subject to dispersal, drop injury, and cold injury as to be ineffective before they could be committed. New paradrop techniques must be developed to allow the dropping of personnel carriers with their fighting crews inside and motors warm and running.

In the middle future, hovering combat vehicles of the ducted fan type may provide the ideal polar region fighting platform. Carried to the drop zone by cargo aircraft, ducted fan vehicles will become airborne under their own power as they leave the carrier aircraft and may drop immediately to the surface with their fighting crews or rendezvous in the air before moving to the attack. Carrying small crews and big punches in the form of rockets and air-to-ground missiles, the ducted fan fighting vehicles will bring to polar ground forces a new order of speed and flexibility and make ground combat operations truly three dimensional.

The control of combat forces will present severe difficulties for both the offense and defense. For much of the year the polar regions see no sun, and polar ground forces must be prepared to fight in darkness as a matter of course. Direction finding is a problem at any season in a region where the magnetic pole lies due west or south of west and where the high latitude renders gyrocompasses unstable.

Visibility on the icecap and in the Polar Basin is unpredictable with local blizzards likely to occur with only a few minutes warning and with "whiteout" an ever-present threat. When whiteout is not present, brilliant sunlight on the snow or sunlight diffused by fog or blowing snow often causes vertigo and loss of perspective and bearing. Mirages occur as the result of temperature inversions. The electrical and magnetic anomalies of the Arctic make electronic equipment performance uncertain. The direction of a battle under these conditions will require a high order of ingenuity and aggressiveness from commanders.

Conclusion

The Army *Icecap* Research Project has solved many basic problems of military operations in polar regions and has defined many others for future solution. More important, the *Icecap* Project has dispelled much of the mystery and awesomeness of the far north. The environment is no longer totally alien. With several years of experience behind them, Army planners now can think objectively about military operations in permanent ice and snow in the land of the midnight sun and the four-months' night.

Soldiers who work and fight above the Arctic Circle must be specialists trained first in their technical skills and then in the special knowledge needed to live and employ these skills in the polar regions. Personnel should be volunteers, with specific physical and psychological aptitudes for the duty. Polar troops must be well-disciplined, with the highest *esprit de corps*, self-confident, and confident of their equipment and leadership. A standard military force trained for temperate zone fighting cannot perform effectively in extreme cold on the basis of a brief period of transition training. The Soviets paid dearly for this lesson when, after World War II, they lost 400 men—most of whom could not be recovered—in one division march maneuver in the dead of the Arctic winter.

Over the entrance to many installations above the Arctic Circle is the legend, *Only the Best Go North.* This is no idle boast. The men who challenge the polar regions *must* be the best.

LUNDY'S LANE
What to Do With an Objective

Captain Carl M. Guelzo, *Transportation Corps*
Student, U. S. Army Language School

OBJECTIVES come in a department store variety of sizes, shapes, and assortments. Some are carefully preplanned and are clearly marked on operational maps; others are stumbled over accidentally and become objectives more out of expediency than design.

That *something* should be done with an objective once taken appears obvious in the light of the American philosophy of taking some action, even if wrong. While inaction may possess many inherent virtues not always well-appreciated, a military objective is a dynamic creature of war which demands equally dynamic treatment. As a result, an objective rarely can be taken and held unless something is done to consolidate the victory.

The changing technology of war frequently dictates new approaches to old problems, among them the problem of holding an objective once taken. In prenuclear decades the standard tactic was physical possession and frequently reorganization of battle-scattered units as well in the objective area. In this modern era of mass destruction weapons, occupation of an objective may be just what the enemy wants—a concentrated target in a relatively small area. Still, inaction is no answer.

Such problems are virtually timeless in the military service, for even the most capable commanders may experience indecision in seeking an answer to the question: what to do with an objective? The immortality of this basic military problem is indicated by the frequency with which it crops up, even in accounts of wars long past fought with weapons and tactical concepts very much different from those of the current day. And the penalties exacted for wrong solutions change even less, the most bitter of which is the expenditure of lives to win a battle only to have the fruits of victory snatched away.

Canadian Invasion

Major General Jacob Brown, for example, learned his lesson the hard way during the War of 1812. In January 1814, after two years of disappointingly fruitless campaigning along the Canadian border, Brown was given command of a small army assigned the task of carrying the war to the heart of British Canada.

Brown's force was composed of three brigades of infantry: a brigade of regulars under the 28-year-old Winfield Scott; a second brigade of regulars under the competent but cautious Eleazar Ripley; and a mixed brigade of militia and Indians under Peter B. Porter. Scott's brigade was supported by a train of artillery under Captain Nathan Towson, while Major Jacob Hindman commanded the artillery

The changing technology of war dictates new approaches to the problem of holding an objective once taken, but abandonment, unless dictated by the over-all strategy of the campaign, rarely is a satisfactory answer

supporting Ripley. A squadron of cavalry under Captain Samuel D. Harris rounded out General Brown's troop list.

Brown sent Scott across the Niagara River on 3 July 1814 to take Fort Erie on the Canadian side, and then followed with the remainder of his army. The fort, poorly armed and lightly defended, surrendered after a brief fight. Scott, ever eager to take the offensive, marched northward up the Canadian side of the river and pushed back an advance guard of British sent out by their commander, Brigadier General Phineas Riall. The forces met head-on at Chippewa Creek and, on Tuesday, 5 July 1814, Brown soundly trounced his British rival in a victory that was a great morale booster to an army that had known only nagging defeat the first two years of the war.

The 6th and 7th of July following the battle at Chippewa were spent in taking care of the casualties. On Friday, 8 July, Brown put his army in marching order and set out in pursuit of Riall. The British general, however, was moving quickly intending to link up with the Glengary, 103d, and 104th Regiments already on the way to him and then return to recoup his losses.

Captain Carl M. Guelzo was graduated with a degree in Business Education from the University of Pennsylvania. He served with the 3d Infantry Division in Korea and at the 2d T Major Port in the Far East. Returning to the United States, he was assigned educational advisor in the Technical Training Department of the Transportation School. Other assignments include duty at the Terminal Services Branch, Transportation Section, Army Forces, Far East; Headquarters, Otaru Sub-Port Detachment, 2d T Port Command C, Japan; and Military Traffic Management Agency, Washington, D. C. Captain Guelzo is the author of "Automation and the Psychology of Logistics," and "Fort Erie: High Point of a Low War" which appeared in the July 1958 and January 1959 issues of the MILITARY REVIEW. *He is a student at the U. S. Army Language School, Presidio of Monterey, California.*

British Reinforced

The situation suddenly improved—for the British. Riall never reached the link-up point at Burlington Heights. Instead, he met the fast-marching British reinforcements shortly after leaving Fort George, and immediately turned back to even his score with Brown. The British went into position about 13 miles from the new American camp at Queenstown.

Brown's confidence received a severe blow on the 23d when General Gaines, in command at Sackett's Harbor, wrote regretting his inability to furnish any assistance to Brown's army due to the illness of the American naval commander and the British blockade of the harbor. Not at all willing to risk a meeting engagement with an enemy force of unknown size, Brown began a withdrawal to his old encampment at Chippewa, hoping to draw Riall into another fight on familiar ground.

Brown camped on the south bank of the Chippewa on 24 July fully expecting a day or two of rest. Twice he refused to grant Scott permission to go in search of Riall—decisions he would deeply regret within 24 hours, for the British had no intention of permitting the Americans to rest.

Sunday evening, 24 July, the same day Brown returned to Chippewa, Riall sent out a strong advance guard consisting of one regiment of infantry regulars, a regiment of Canadian militia, detachments of yet another regiment, a troop of Dragoons, and an artillery detachment, all under Lieutenant Colonel Pearson, a soldier of considerable recent experience in leading advance guards toward the Americans. By 0700, Monday, 25 July, Pearson had advanced unopposed as far as Lundy's Lane, less than five miles from Chippewa. Rather than risk meeting the Americans head-on, Pearson went into position on a hill at Lundy's Lane which

commanded the main Queenstown road. This was not the only British activity.

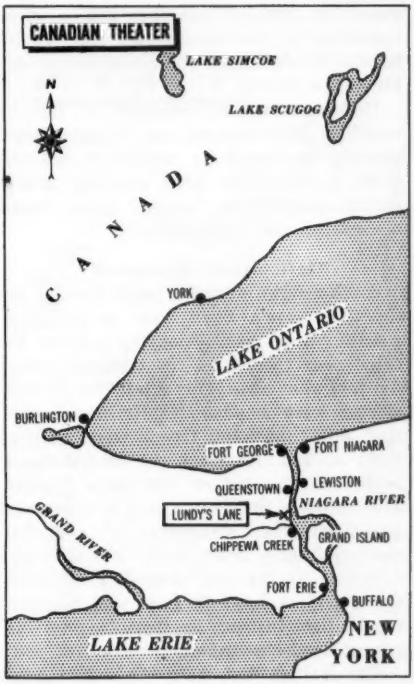
After two years of dealing out humiliating defeats to the Americans, British Army Headquarters at Kingston listened incredulously to the news of the thumping American victory at Chippewa. Lieutenant General Gordon Drummond immediately set his troops in motion, also on Sunday, 24 July. He marched to York, embarked his troops, and landed at Fort Niagara, across the river from Fort George and on the American side, early Monday the 25th. Drummond sent a battalion to bolster Riall and then dispatched portions of two regiments—the 41st and Royal Scots—against American forces at Lewiston three miles to the south.

Erroneous Assumption

The incomplete information Brown began receiving of enemy troop movements resulted in a serious error in judgment. The British force sent against Lewiston chased American troops out of the town and then crossed the Niagara River, landing at Queenstown. The fleeing American troops raced south as far as Fort Schlosser where they, in turn, crossed the river and joined Brown at Chippewa. Brown immediately—and quite erroneously—assumed that Drummond was attempting to take his supply depot at Fort Schlosser and based his battle plans on diverting the British from his logistical base.

At 1400, 25 July 1814, Major Thomas S. Jesup, commander of the 25th Regiment which was part of Scott's brigade, brought word from Lieutenant Colonel Henry Leavenworth of the 9th Regiment that a large number of British troops had been sighted at Niagara Falls two miles away. Brown still believed the main British effort to be directed at Fort Schlosser and regarded the new information as a highly inflated description of a light reconnaissance party. Brown felt the best way to protect his supply base was to threaten anew the British forts at the mouth of the Niagara River, and around 1600 he ordered Scott to reoccupy Queenstown.

Within an hour Scott was ready. His brigade now consisted of Jesup's 25th Regiment, Leavenworth's 9th Regiment, the 11th Regiment under Major McNeil, the 22d Regiment under Colonel Brady, a



troop of cavalry led by Captain Harris, and Towson's artillery. At 1700 Scott moved out.

The British were informed almost immediately of the American movements. Riall, worsted once before by Scott at Chippewa, promptly turned back toward Queenstown; but a stronger hand was now directing British tactics. Riall met General Drummond who stopped the re-

treat and turned the column toward the advancing Americans. Drummond reached Lundy's Lane first and set to work strengthening the position. On the hill, Drummond now had an artillery battery of five pieces: two 24-pounders, two 6-pounders, and a 5½-inch howitzer. Supporting this battery, he disposed his forces in a rough semicircle to the rear of the guns. His position was such that anyone marching up the Queenstown Road could be met by the direct and combined fire of his entire force.

Unfortunately, the strength of Drummond in both numbers and location was entirely unknown to either Brown or Scott. In fact, even when apprised of the British position at Lundy's Lane, Scott discounted the information.

Information Discounted

An American advance party moving up the Queenstown Road noted a group of British officers hastily leaving a house located near the Falls. The occupant readily told the Americans that the British officers were members of General Riall's staff and that 1,100 troops were nearby. Scott scoffed. Had not the British been beaten on the 5th of that very month? This could be little more than a light rear guard, probably straggling after Riall's shattered army. Scott boldly took his command on up the road intending to enter the woods at Lundy's Lane and disperse the British. Instead, he stumbled into the strong British position.

The British had been waiting almost three weeks for this moment. They reacted instantly by opening fire on the exposed Americans.

Scott faced two alternatives, both equally uncomfortable. He could, of course, retreat. But even if the British chose not to pursue, the new objective—personified by the force astride the route of march—would never be taken by a withdrawal. If Riall elected to pursue, he would simply be leading an unknown, but undoubtedly large, force of British to the remainder of Brown's army. Instead, Scott chose an attack, hoping to persuade Riall that the entire American Army was engaged in the action.

The retreat-minded Riall persuaded easily enough, but he was no longer in command. General Drummond declined to withdraw, and when Scott charged up the hill at 1830 the British were still in place. Prudently, Scott sent back for reinforcements, but they were slow in coming. For one full hour the 1,800 men of Scott's brigade faced the combined and concentrated fury of 4,500 Britishers. Scott was in trouble almost immediately.

Captain Towson tried desperately to engage the British artillery with his own guns, but, to his deep concern, found that he could not elevate his pieces enough to bear on the gun position atop the hill. This time the infantry would have to attack into the heavy musket and cannon fire without artillery support.

Flanking Movement Unsuccessful

In the gathering darkness Scott perceived only one weakness in the British troop dispositions. The bulk of the British force was strung out across the top of the hill to the rear of the artillery battery. The British left rested on the Queenstown Road, along which more reinforcements were expected momentarily, leaving a space of about 200 yards between the road and the river. Scott, unaware that Drummond's reinforcements were marching hastily down the road, sent Jesup with his 25th Regiment sneaking into the brushwood of this gap. The strength of the British left flank was such, however, that Jesup could do little than provide troublesome harassment without being able to turn the flank completely.

Scott's first charge up the hill was bloodily unsuccessful. Both the 11th and 22d Regiments staggered back down, great gaps torn in their lines. Jesup's 25th Regiment was having troubles of its own

infiltrating through the brushwood on the British flank, for Drummond's reinforcements were drawing closer. Slowly, Scott's brigade was being cut to pieces by the showers of lead from the crest of the hill. Desperately, Scott tried to hold on until Brown could arrive with the rest of the army.

Distance, not indolence, delayed the American reinforcements. Brown, hearing the rattle of muskets in the distance, correctly assumed that Scott once again was in a fight, and hurried both Porter and Ripley off to the aid of the heavily engaged brigade.

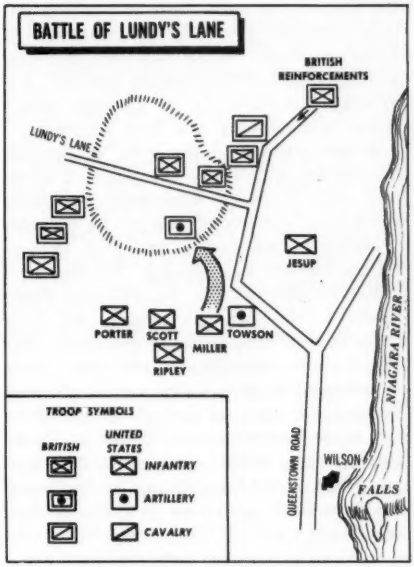
Shortly before 1930, almost an hour after Scott had confidently charged up the hill into the British trap, Colonel Leavenworth was fully prepared to end the apparently senseless slaughter of his men by withdrawing, for the brigade was rapidly falling apart from the terrible losses. The 11th Regiment had already disintegrated, its ammunition gone and its commander, Major John McNeil, a casualty along with most of his officers. The survivors joined the 9th Regiment which also soon received the remnants of Colonel Brady's decimated 22d Regiment. With Jesup still behind the British left flank, the 9th Regiment remained the sole rallying point for the entire brigade.

In a previous discussion of withdrawals, Scott had remarked that he would never retreat until every third man was killed. With half his command dead or wounded, Leavenworth said to Scott, "Your rule for retreat is fulfilled." Scott, his mind on Brown's advancing army, stubbornly refused.

American Reinforcements Arrive

Around 1930 Ripley's brigade reached Lundy's Lane, with Porter at his heels. Brown formed Ripley's brigade to the front of Scott's exhausted troops and sent Porter to attack the British right flank. The renewed American assault relieved the pressure on Jesup's 25th Regiment long enough to permit him to capitalize on the temporary confusion.

In the darkness Jesup ordered a detachment under Captain Ketchum out as a flanking party while he prepared to fight back to the American lines. The detachment ran head-on into General Riall hurrying to reconnoiter the rapidly changing situation. Captain Loring, one of Riall's aides, mistook Captain Ketchum's



unit for a company of redcoats in the blackness and called out, "Make room there, men, for General Riall."

Ketchum promptly replied, "Aye, aye, sir!" and opened his ranks for the aide to pass. The Americans just as promptly closed the jaws of the trap when the general rode up with his officers and offered him the courtesy of their fixed bayonets. Ketchum had the pleasure of delivering the British general to Scott personally.

The advantage achieved by the arrival of the American reinforcement proved

XUM

only temporary. The British rallied quickly and Brown found himself no further toward capturing his objective than Scott had been an hour before. Jesup finally managed to punch his way back to friendly soil; but with the loss of the screen provided by the 25th Regiment, Drummond's reinforcements rushed forward and joined their comrades.

The critical point, obviously, was the artillery battery on the hill from which the British gunners were delivering fatally accurate fire into the unprotected American ranks. When even the reinforced attacks failed, Brown tried one last approach. He rode up to Colonel James Miller commanding the 21st Regiment.

Brown pointed to the crest of the hill illuminated fitfully by the glare of artillery fire. "Colonel, take your regiment, storm that work, and take it," he ordered.

Miller smiled grimly and then immortalized himself by replying, "I'll try, sir."

Brown directed the 1st and 23d Regiments to support the attack, but both units had suffered so many casualties that Miller was virtually on his own. Scott volunteered to lead Miller part of the way up the hill since he had already covered the same ground several times in fruitless charges. Miller took about 300 men and crept up the hill, covered by the heavy darkness and guided by a shrub-covered rail fence.

British Battery Overrun

Miller approached the British battery slowly and cautiously. In the press of battle the British had staked out no outposts, deeming them unnecessary in the almost continuous fighting. As a result, Miller managed to get within 12 yards of the British gunners, close enough to be able to see the redcoats standing by their pieces with matches ready.

Mindful of the woeful inaccuracy of the flintlock musket even at close range, Miller quietly directed his men to rest their muskets on the rail fence and take careful aim at the gunners. The rattle of musketry elsewhere on the battleground drowned the tiny metallic clicks as each man cocked his flintlock. With infinite caution they laid their weapons across the fence, scarcely rustling a leaf. Miller waited until the shrubbery on the fence bristled with firmly braced muskets—and then gave the command to fire.

The volley swept the artillery position clean of gunners, stretching them between their cannon. The 21st Regiment, taking full advantage of the shock that swept the British lines at the unexpected volley, rushed into the center of the battery. The protective line of infantry to the rear of the battery fired a volley in answer and then charged with fixed bayonets. Miller stoutly stood his ground.

Brown moved quickly as soon as he was assured of the momentary success of the 21st. Ripley and Porter were pushed into position on the hill barely in time to meet the first British counterattack. Brown held his fire until the British were within 20 yards of the new American lines. Twenty minutes later the redcoats staggered back down the hill even as Scott had been forced to do earlier in the fight.

Despite the exhausted condition of the men still on their feet in Scott's brigade, Brown ordered them into the line—and found that Scott could barely muster a battalion of effectives. A half hour later the British again attempted to regain the hill—and again unsuccessfully. By now every regimental commander was either dead or out of action, including the now horseless Scott.

Third Counterattack

The battlefield lay quiet for almost an hour. Out of sight, but not beyond hearing, the British were reforming their lines and filling their ranks with yet another contingent of fresh troops. On the hill the Americans waited tensely, listening to the scurrying below as the British prepared for a third counterattack. Toward mid-

night the expected assault boiled out of the darkness, and so exhausted were the defenders that the British succeeded in penetrating the position. The fighting swirled among the artillery pieces as the Americans clung to their hard-won objective. Brown and Scott were so badly wounded during the third attack that both had to be carried out of action. Led by the still unwounded Ripley, a master of the defense, American tenacity paid off and by midnight the British troops were again repulsed.

Brown, in considerable pain from his wound, still insisted on retaining active command rather than leave the job to a subordinate. But Brown no longer had an effective fighting force. The infantry had been in constant action for almost six hours, much of the time occupied with desperate charges uphill and in hand-to-hand combat. Unit integrity was gone and casualties were high. The 11th Regiment had lost all its officers above the grade of lieutenant, and other organizations could muster but a pitiful handful. Ammunition was almost gone and the men had been without water for hours in the parched July night.

Fortunately for the small band of exhausted men on the hill, the British were little better off. Their casualties, especially in the three counterattacks thrown at the hill, were even greater than the Americans. Neither side, of course, had any way of assessing accurately the amount of damage sustained by each; but the pain-wracked American commander was no longer thinking clearly.

Objective Abandoned

Brown paused long enough to commend Miller for his successful assault. "You have immortalized yourself!" the general remarked. "My dear fellow, my heart ached for you when I gave you the order, but I knew it was the only thing that would save us."

And then he ordered his army off the hill and back to camp.

Ripley, the only senior officer not wounded in the battle, had orders to return at daybreak and either spike or carry off the British cannon; but dawn the 26th of July found Ripley undecided. He had few horses, no dragropes, and only a handful of weary men. By the time Ripley made up his mind to do as ordered, the sun was high and the British once again were in possession of the hill and their artillery.

Brown almost wept in his fury. He had won a victory even more brilliant than Chippewa—a victory expensive in daring, boldness, and lives, for it cost over 850 American casualties. That the British lost over 870 men was of less importance than the fact that Brown had lost the objective and with it the fruits of his success.

Conclusion

What to do with an objective?

In the modern nuclear era, reorganization and consolidation in the vicinity of the objective rather than on it are acceptable solutions. But abandonment, unless dictated by the over-all strategy of the campaign, rarely is a satisfactory answer. An objective worth taking also is worth keeping; but the history of war never lacks for examples of otherwise competent commanders who must learn this lesson anew at a needless sacrifice of both lives and the complex of emotional intangibles on which the fighting *esprit* of an army is based.

XUM

THE UNITED STATES AIR FORCE

Material for this article was furnished by Headquarters United States Air Force.—Editor.

THE United States Air Force traces its origin to the establishment on 1 August 1907 of an Aeronautical Division in the Signal Corps of the United States Army. From this small beginning—the division originally had only one officer and two enlisted men assigned—the Army air arm grew slowly so that on the eve of World War I, in April 1917, it had approximately 1,200 officers and men and fewer than 250 planes of all types.

World War I gave a tremendous impetus to Army aviation which was separated from the Signal Corps in May 1918, designated Air Service, and made a separate service of the Army. This separate status was confirmed by law in 1920, and the Air Service became a combatant arm of the Army with an authorized strength of 1,516 officers and 16,000 enlisted men.

The agitation for a separate air force led by Brigadier General William Mitchell during the early 1920's resulted in a change of title for the air arm—from Air Service to Air Corps—on 2 July 1926. A further step toward emphasizing the combat function of military aviation came with the establishment of the General Headquarters Air Force on 1 March 1935. This also had the effect of splitting the Army air arm into two parts, with the combat units under the General Headquarters Air Force while administrative and logistical elements remained under the Air Corps.

The rapid expansion of the air arm after 1939 proved a powerful incentive for unifying the two parts. After interim devices had failed to meet the need, the establishment on 9 March 1942 of the Army Air Forces as one of three major commands of the Army provided a unified command that saw the air arm through World War II and into the postwar period. The National Security Act of 26 July 1947 provided for the establishment of the Department of the Air Force and the United States Air Force. These two organizations came into official existence on 18 September 1947, climaxing 40 years of military aviation in the United States. The Air Force became an independent military service, coequal with the Army and the Navy under the Department of Defense.

Mission and Organization

In broad terms, the wartime mission of the Air Force is to employ airpower to destroy the ability of an enemy to wage war. The major tasks of the Air Force are:

1. Strategic air warfare—intercontinental operations against an enemy's long-range airpower and other targets vital to his ability to wage war.

2. Tactical air operations—short-range air operations within a theater of war.

3. Air defense—primarily defense of the Continental United States and vital oversea areas against aerial attack.

4. Air transportation—movement of men and materiel for the Armed Forces.

To carry out these missions the Department of the Air Force is organized into 17 major field commands directed by the

The United States Air Force is continuing to develop advanced aircraft in order that it may have a mixed force of planes and missiles that will permit the most effective performance of its wartime mission

executive portion of the department in Washington. The Office of the Secretary of the Air Force and the Headquarters USAF, known as the Air Staff, comprise the Washington establishment.

The Strategic Air Command, with a strength of 3,000 aircraft and 200,000 officers and airmen deployed throughout the world, is the largest USAF combat command and its most powerful striking force. The Air Defense Command, the Tactical Air Command, and the Military Air Transport Service, based chiefly in the Continental United States, are responsible for carrying out the remaining tasks set forth here. The Secretary of the Air Force acts as the single manager for the Military Air Transport Service which has Navy as well as USAF air transport units.

Overseas, the United States Air Forces in Europe and the Pacific Air Forces include powerful tactical and air defense units prepared to operate in conjunction with US Army and Navy forces. The Alaskan Air Command plays an important role in the air defense of North America. The Caribbean Air Command is concerned chiefly with the support of USAF missions to Latin American countries and the training of Air Force personnel from those countries.

The Air Training Command has the task of sending a steady flow of skilled officers and airmen—pilots, navigators, mechanics, cooks, and drivers—into every USAF unit. The Air University directs the professional education of Air Force officers through its own schools and colleges at Maxwell Air Force Base, Alabama, and elsewhere, and through a large number of civilian colleges and universities. USAF reserve activities, involving the training or administration of several hundred thousand officers and men, are concentrated under the Continental Air Command.

The Air Materiel Command (AMC) and the Air Research and Development Command (ARDC) provide a full range of logistical support for the huge and complex USAF establishment. ARDC handles the development and much of the testing of the advanced aircraft, missiles, and spacecraft which are the combat strength of the Air Force of today and tomorrow. AMC operates a farflung logistical organization that annually procures billions of dollars of weapons and equipment and provides for the supply and maintenance of the myriad items of materiel used by the Air Force.

Other specialized functions are performed for the Air Force by the Headquarters Command at Bolling Air Force Base, Washington, D. C., the USAF Security Service, and the Air Force Finance and Accounting Division.

The Air Force has a key role in certain joint commands that come under the operational control of the Joint Chiefs of Staff and certain combined or international commands. The Strategic Air Command, although wholly Air Force in its composition, is designated as a specified command under the JCS. The Continental Air Defense Command, comprised of Army, Navy, and Air Force elements, is commanded by an Air Force officer, as is also the Alaskan Command, another joint organization. US Air Force officers also command the Supreme Headquarters, Allied Powers Europe (SHAPE) and the North American Air Defense Command (NORAD), both international commands.

Weapons

At the end of 1958 the Air Force had a strength of approximately 850,000 officers and men and 112 combat wings. With the exception of the troop carrier units, all of these wings were equipped with jet aircraft. Strategic Air Command bombardment wings flew *B-52's* and *B-47's*, and the large tanker fleet flew *KC-97's* and jet *KC-135's*. Air Defense Command interceptor units had *F-86's*, *F-89's*,

XUM

F-102's, and *F-104's*. The wings assigned to the Tactical Air Command and the oversea combat commands operated *B-57* and *B-66* tactical jet bombers, *F-86*, *F-100*, *F-101*, and *F-104* fighters, and *C-119*, *C-123*, and *C-130* troop carriers. The Military Air Transport Service, responsible for providing airlift for the Department of Defense in time of war, operated a large fleet of transports—chiefly *C-118's*, *C-121's*, and *C-124's*, plus a small number of *C-133* turboprops.

To complement this large force of manned aircraft units, the Air Force had in operation or under development a large and varied assortment of missiles. Among the strategic missiles, two intermediate range ballistic missiles (IRBM's)—the *Thor* and the Army-developed *Jupiter*—had been developed and tested and units to handle them were either operationally ready or in training. Other wings were training to operate the *Atlas*—a proved intercontinental ballistic missile (ICBM). The *Titan*—another ICBM—was still under development. Another strategic missile of intercontinental range—the cruise missile *Snark*—was fired in operational tests by a strategic missile squadron.

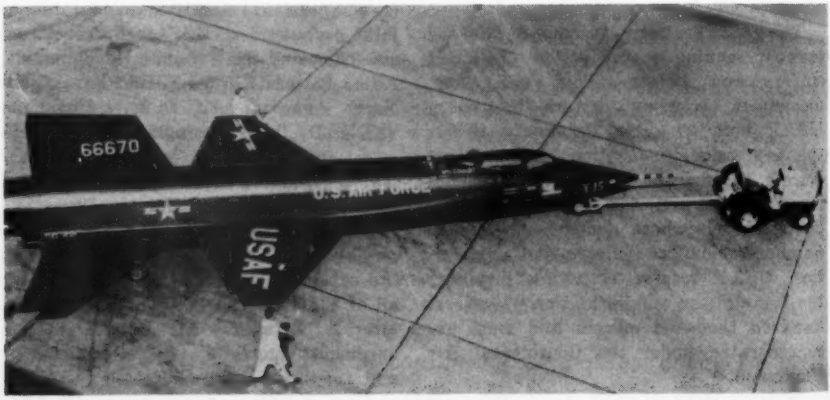
The major USAF air defense missiles included the *Bomarc*—a rocket-launched supersonic ramjet missile with a range of several hundred miles. Interceptor planes also were equipped with a number of potent air-to-air missiles, among them the atomic-warhead *Genie*, the Navy-developed *Sidewinder*, and the *Falcon*.

For tactical air use, the *Matador*, a subsonic ground-to-air missile, became operational in 1954. As both a supplement and a replacement for the *Matador*, the Air Force was readying the *Mace*, equipped with new and superior guidance systems.

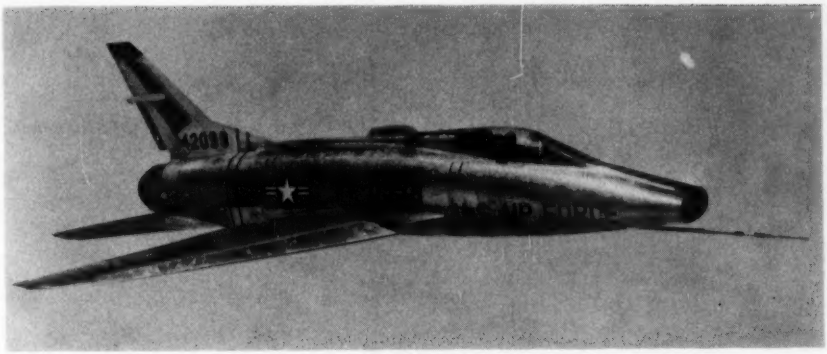
Conclusion

Manned aircraft strength is being reduced as part of a carefully planned program for integration of missiles into the USAF combat forces based on the speed with which they can be made reliable for combat. Meanwhile, the Air Force will continue to develop advanced aircraft in order that it may have a mixed force of planes and missiles that will permit the most effective performance of its mission.

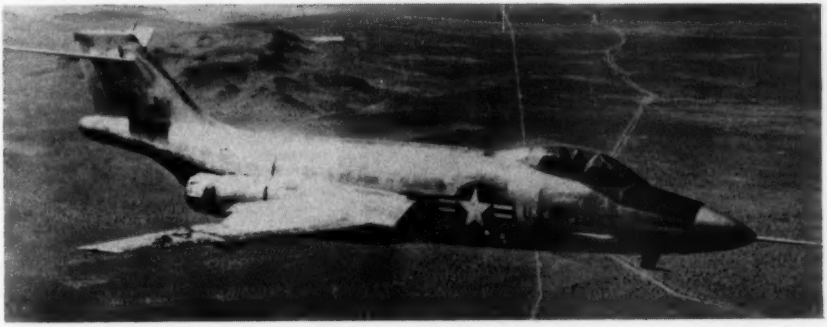
The following official United States Air Force photographs portray a limited coverage of the vast area of responsibilities and equipment of this triservice team partner.



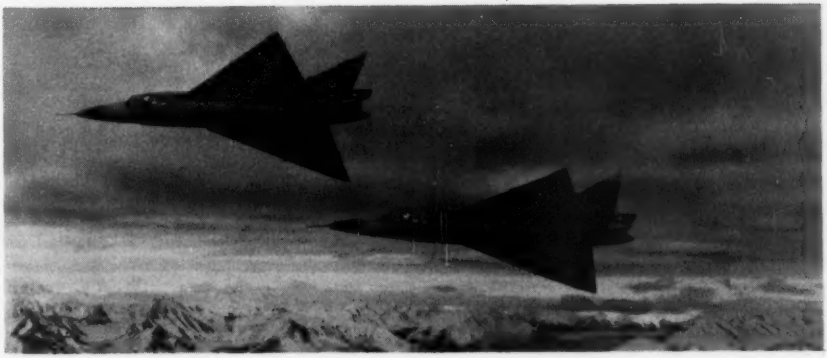
X-15



F-100 Super Sabre

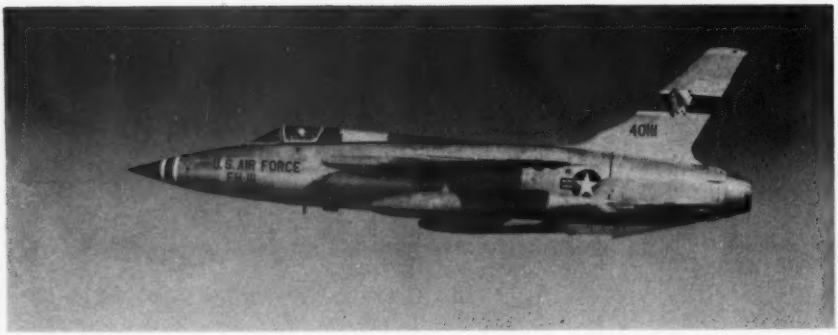


F-101 Voodoo



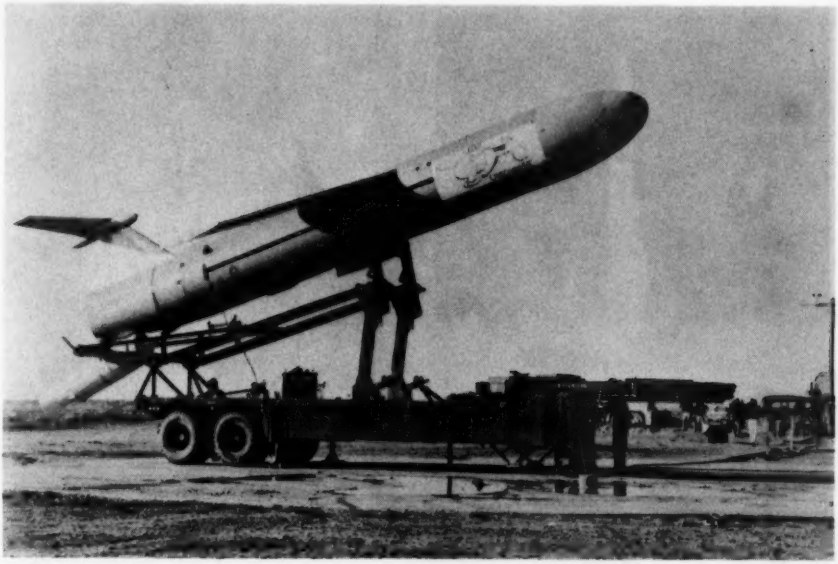
F-102 Delta Daggers

F-104A Starfighter

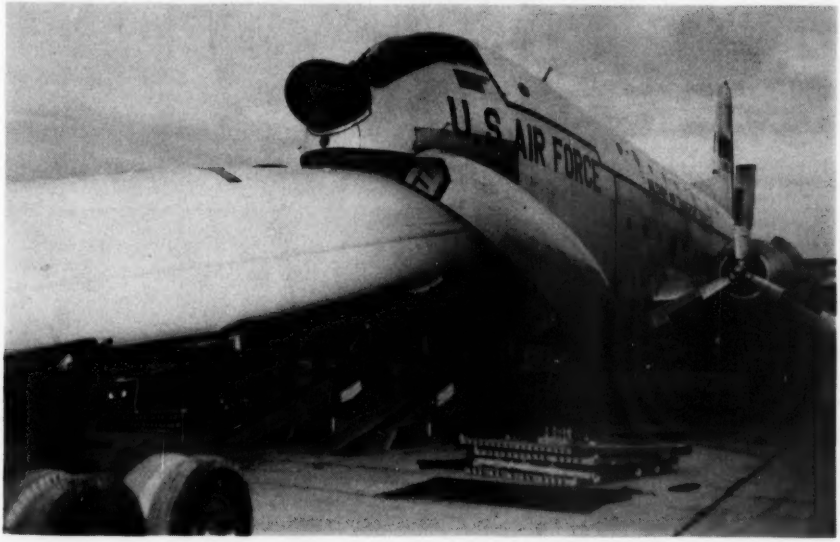


F-105 Thunderchief

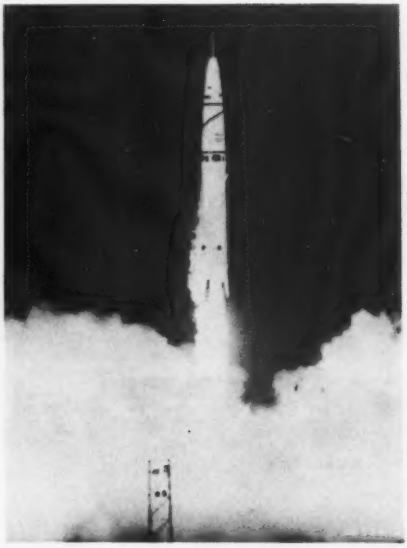
F-106A Delta Dart



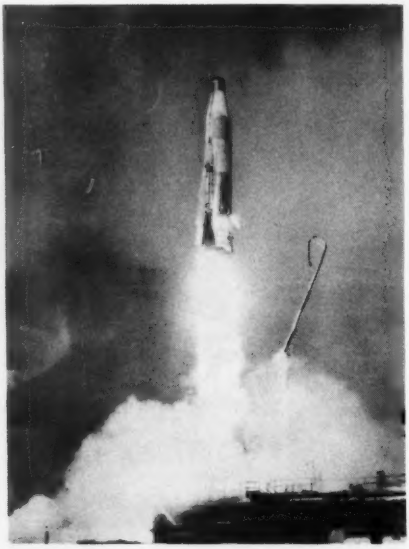
The *Mace*



Loading the *Thor* in a *C-124 Globemaster*



The *Thor*



The *Atlas*

B-47 Stratojets

B-52G Stratofortress

B-58 Hustler

A *KC-135* refueling a *B-52 Stratofortress*

C-123 Provider

C-124 Globemaster

C-130 Hercules

C-133 Cargomaster

RB-66 Destroyer

RC-121

GIVE IT GUIDANCE

Lieutenant Colonel Stephen Silvasy, *Artillery*
Student, U. S. Army War College

Our Army must have the means of applying at any specific point, and at any precise moment, the exact amount of force required for the accomplishment of the specific task that may confront it at any particular time. Our Army must always have in its arsenal an adequate supply of atomic weapons in a variety of sizes which can be used with discrimination against close-in as well as distant pinpoint targets, with extreme accuracy day or night, despite rain, snow, fog, or any other weather condition. They are necessary in order that we may be able to support our troops properly in any battle situation without unnecessary wholesale destruction.

Secretary of the Army Wilber M. Brucker

COMMANDERS now have at their disposal the most powerful means yet devised for influencing the course of battle—nuclear weapons.

The availability of a wide range of nuclear weapons to provide massed firepower of unprecedented destructiveness in the most concentrated and shattering form enables a commander to achieve results quickly which would otherwise be either impossible or obtained only after days or even weeks of bitter and costly combat effort. Properly employed, nuclear weapons can almost instantly change the tide of battle and thus will be a major, if not the principal, factor in an operation or campaign. The decisiveness of the results made possible through the effective employment of nuclear fires is such that the commander himself must give a great deal of thought to their use since one of the fundamental aims of the tactical commander is to apply optimum combat power to the accomplishment of his mission.

Based on the mission and information available to him, the commander prepares and issues his planning guidance to his staff. This planning guidance may include any special factors and aspects of the situation—including the use of nuclear weapons—which the commander considers unusual or important. The commander's guidance is the basis for the ultimate detailed target analysis in planning for the employment of nuclear weapons to support a specific mission.

Results from nuclear explosions fall into two general categories—desirable and undesirable. When nuclear weapons are employed, casualties or damage to the enemy is desirable, while casualties to friendly troops and damage to their equipment or to installations of future value to us are not desirable. The ideal situation would be one in which we could completely destroy the enemy with no risk whatever to ourselves or to friendly forces including allied or neutral civilians. Obviously, such

The commander's guidance is the basis for the ultimate detailed target analysis in the employment of nuclear weapons to support a specific mission and must be effectively, thoroughly, and carefully implemented

XUM

a fortunate situation will rarely, if ever, occur. Casualty and damage requirements often will conflict with safety requirements. While descriptive guidance as to what is wanted or unwanted is desired, it should not be unduly restrictive and may be as detailed or specific as necessary or as available information permits.

In addition to the general scheme for the integration of nuclear fire and maneuver, the commander's planning guidance often covers the following three areas:

1. Casualties and damage.
2. Troop safety from initial effects.
3. Contingent requirements covering residual contamination, obstacles, unwanted casualties or damage, bonus damage, and a reserve of nuclear weapons.

Each of these will be discussed briefly with an indication of how guidance may be stated.

Casualties and Damage

It is possible virtually to obliterate a target with nuclear weapons, but this cannot always be done without large nuclear expenditures, or, as is often the case, without endangering our own troops. Additional drawbacks to the natural tendency of desiring *maximum* destruction of the enemy by the indiscriminate use of large-yield weapons are the creation of large obstacles and fires and the unnecessary destruction of nonmilitary targets including innocent bystanders, crops, houses, and trees. *In some rare instances,* however, total destruction may be the logical answer. On the other hand, commanders need not and should not rely solely on nuclear weapons to accomplish the desired destruction of the enemy. Conventional fire support should be used upon appropriate targets and nuclear weapons reserved for those targets requiring their magnitude of power. A nuclear attack must contribute materially to the accomplishment of the mission of the command.

Command and staff consideration must be given to the following question. How much of the target must be rendered ineffective to ensure the success of the nuclear attack? The interrelationship between fractional casualties or damage, the probability of attaining *at least* a specified fraction of casualties or damage, and the impact of these on required yield is graphically presented for a typical target and delivery system in Figure 1.

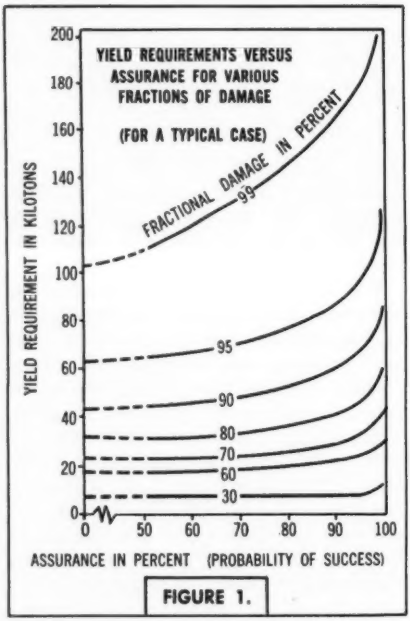


FIGURE 1.

It can be noted from Figure 1 that the required yield increases rapidly for either very high assurances *or* fractions of damage. Particularly, fractions of damage greater than 80 percent, and assurances greater than 90 percent are very demanding on yield requirements. Further, when nuclear force is wasted in overdestruction, eventually there will be fewer supporting nuclear strikes.

Of Vital Concern

The results which a commander expects from a nuclear attack will have a major influence on his choice of a course of action as well as on his organization for combat. Thus when he states his initial planning guidance, he must specify or imply what results he desires from the attack. Primary and alternate tactical plans are based on the expected conditions in the target area as predicted in the detailed target analysis.

In arriving at the results desired, the commander (assisted by his staff) considers many influencing factors to include but not limited to the following: mission; type of maneuver to include timeliness of exploitation; nature, vulnerability, and recuperability of the targets; strengths and dispositions of opposing forces; and terrain, to include trafficability and obstacles to movement.

From the standpoint of efficient use of available weapons, the casualties or damage desired should be that which the commander considers essential to ensure the success of the maneuver and the accomplishment of the mission. *As this is a minimum figure*, a fairly high assurance of attaining at least this minimum figure is justified.

The present trend is for the commander to express guidance as to casualties or damage desired in a general manner. However, the use of such descriptive terms as "destroy," "neutralize," is vague guidance unless each term has a specific qualitative definition and an associated quantitative fraction of casualties or damage expected to produce these results.

DEFINITIONS

Qualitative	*Quantitative* Target Coverage Personnel Casualty and Materiel Damage Fraction
DESTROY: to render completely ineffective as a combat unit, or as a supporting unit or installation, through extensive loss of key personnel, command and control facilities, and/or materiel; requires withdrawal from action and complete reorganization, replacements, resupply, and retraining.	At least 1/3
NEUTRALIZE: to render ineffective for a period of time through random loss of key personnel, command and control facilities, and/or materiel; requires reorganization, replacements, and resupply.	At least 1/10 Up to 1/3

Figure 2.

The qualitative and quantitative definitions outlined in Figure 2 are offered by the author as a guide to standardize a commander's use of these (or similar appropriate) terms in the nuclear attack of units (personnel casualties within some period of time) or of installations (moderate or severe damage to materiel items of interest).

Nuclear weapons are used to destroy enemy combat capability. Loss of military effectiveness is best achieved by attacking

personnel, rather than materiel; however, inflexible rules governing the employment of nuclear weapons cannot be established. In the attack of most tactical targets, which consist of personnel and their equipment, the most vulnerable element usually is personnel. Exceptions to the rule of "shoot for casualties rather than materiel damage" are key materiel targets which have military importance in themselves, such as missile launchers, guidance equipment, bridges, or buildings.

Conservative Procedure

The Army's philosophy of nuclear weapons employment results in a target procedure which is inherently conservative —that is, a weapon system is selected so that the commander can expect at least the casualties or damage indicated in his guidance, with the possibility that he may get more but with a virtual certainty that he will not get less. In addition, there will be many bonus casualties and much bonus damage. Many personnel will have minor wounds and burns which do not render them ineffective but which hamper their efficiency; equipment suffering light or no damage will be temporarily out of action until the debris and dust have been cleared therefrom. Dazzle effect will be temporarily significant, and mental shock will further diminish the effectiveness of many additional personnel aggravated by dispersion of the unit effort required to regain effective control.

Commanders may habitually express initial guidance in a qualitative or general manner. After deciding upon a course of action the guidance may well be more specific. This does not mean that the guidance should be any less clear, or that the commander is in any way relinquishing his control of nuclear fires to a junior staff officer, for example, the nuclear weapons employment officer. On the contrary, the commander is stating his guidance in an understandable and flexible form. An example of *general* guidance with respect to casualties and damage follows.

Use nuclear weapons to ensure a penetration of the enemy position; neutralize known local reserves which can interfere with this penetration; destroy all armor units which threaten the accomplishment of my mission.

The following is an example of *specific* command guidance with respect to casualties and damage.

One-quarter to one-third casualties at one hour are acceptable to ensure rupture of the enemy position; I want at least one-third casualties within two hours on located enemy local reserve units in front of our main effort; plan to get moderate damage on about one-half the tanks in the tank regiment at _____.

It is normally unnecessary for the commander to specify the percentage assurance that he wants of achieving the desired casualties or damage. It will be assumed that he wants a *high* assurance unless he states otherwise. An assurance on the order of 90 percent is considered a high assurance for casualties or damage.

Damage Assessment

Immediately following the use of a nuclear weapon on an enemy target, vigor-

---

Lieutenant Colonel Stephen Silvasy is the author of "Atomic Planning for Rear Areas" which appeared in the October 1958 issue of the MILITARY REVIEW. *He was graduated from the United States Military Academy in 1940; the Advanced Course of the U. S. Army Artillery School, 1950; and the Special Weapons Course of the U. S. Army Command and General Staff College in 1954. During World War II he served in the Pacific with the Antiaircraft Section, Headquarters Tenth Army, and in the occupation of Japan. Other assignments include duty in the G4 Section, Headquarters Seventh Army, Europe, 1951-53, and as commanding officer, 80th Airborne Antiaircraft Battalion, and G2, 82d Airborne Division, 1953-55. He was a member of the faculty of the USA CGSC from 1955 to June 1959, when he was assigned as a student to the U. S. Army War College.*

ous effort should be made to determine the extent of casualties and damage to permit comparison of the results obtained with the results predicted. The categories of direct and indirect damage assessment have been redefined recently by USCONARC. Direct damage assessment, that is, assessment by direct examination of the strike area by aerial observation, aerial photography, or, when feasible, by ground observation, provides the best information of casualties and damage. In some instances an indirect damage assessment can be made. This is a revised target analysis based on reported data, obtained by means other than by direct damage assessment, on actual weapon yield, burst height, and ground zero which justify a reanalysis.

The primary or an alternate plan is executed depending on the reevaluated results of the actual burst conditions. The impact of the actual condition of the target—that is, casualties, damage, obstacles, or contaminated areas—on the planned operation must be quickly evaluated prior to commitment of exploiting forces. Situations more or less favorable than those originally predicted may arise where changes of direction or even cancellation of an attack may be possible or necessary. Tactical plans must be flexible to permit needed adjustment since movement of units during a nuclear preparation may be precluded or restricted.

Troop Safety

Troop safety is a most important command responsibility. With respect to locations of targets to be attacked with nuclear weapons, targets can be placed in two general categories: distant and close-in. In nuclear attacks against distant targets, troop safety is a matter of concern from several viewpoints:

1. When areas of fallout contamination result from surface bursts, either deliberate or inadvertent, which may preclude or interfere with our use of, or passage through, these areas.

2. Provision of a reasonable margin of safety for military and civilian populations and resources of friendly and neutral countries, consistent with the attainment of objectives.

3. Temporary dazzle effect (or loss of night vision if the nuclear attack is at night).

Of more direct concern are attacks against close-in targets. In these cases, troop safety considerations may determine whether nuclear or nonnuclear weapons will be used. And if nuclear weapons are used, troop safety may influence the selection of yield, delivery system, location of desired ground zero, time of burst, and scheme of maneuver.

What then are the commander's responsibilities with respect to troop safety? First, when a commander orders a nuclear attack of close-in targets, he must also establish the degree of risk to which his forces may be subjected and the assurance he desires of not exceeding this risk. Second, he must specify the vulnerability condition expected to prevail at burst time. These may well be a matter of standing operating procedure (SOP).

Degrees of Risk

From the command guidance aspect there are three degrees of risk, currently delineated in Army publications, which a commander may accept under differing tactical conditions—negligible, moderate, or emergency.

1. At a *negligible risk* distance, troops are completely safe, with the possible exception of temporary loss of night vision or dazzle effect. A negligible risk is acceptable in any case when the use of nuclear weapons is desirable. *A risk greater than negligible will be accepted only when significant advantages will be gained.*

2. At a *moderate risk* distance, anticipated effects levels are tolerable, or at worst a minor nuisance. In rare instances

some individuals may require evacuation because of radiation sickness, particularly if they have been exposed frequently to radiation. Moderate risk is considered acceptable in close support operations; for example, to create a gap in enemy forward positions to aid a penetration, or to hit the assault wave of an enemy attack. *A moderate risk should not be exceeded if the troop units are expected to operate at essentially full efficiency after the burst.*

3. At an *emergency risk* distance, the anticipated effects levels may cause some temporary shock, a few casualties, and may significantly reduce the unit's combat efficiency. An emergency risk should be accepted only when absolutely necessary and *be exceeded only in extremely rare situations.*

Vulnerability

Closely associated with the degrees of risk is the *vulnerability* of the individual soldier. The danger to an individual from a nuclear explosion depends principally upon the degree to which he is protected from, or vulnerable to, the weapon effects. A man in a foxhole is relatively well-protected and can safely be much closer to ground zero than can a man in the open. One or more of the following three conditions of personnel vulnerability can be expected at the time of burst: *exposed, unwarned; exposed, warned;* and *protected, warned.*

1. *Exposed, unwarned* persons are assumed to be standing in the open at burst time, but have dropped to a prone position by the time the blast wave arrives. They are expected to have areas of bare skin exposed to direct thermal radiation, and some personnel may suffer temporary dazzle. For example, such a condition can be expected to prevail in an offensive situation where the majority of the attacking infantry are in the open, and a warning of the burst has not been or cannot be disseminated.

2. *Exposed, warned* persons are assumed to be prone on open ground, with all skin areas covered, and with an over-all thermal protection at least equal to that provided by a two-layer summer uniform. This condition may be expected, for instance, when a nuclear weapon is detonated over an "on-call" target during an attack; troops are expecting the burst, but do not have time to dig foxholes.

3. *Protected, warned* persons are assumed to be "buttoned up" in tanks or crouched in foxholes with improvised overhead thermal shielding. An example of this condition is the use of nuclear weapons to support an armored exploitation.

Note that there is no category for protected, unwarned. Although protection may be available to personnel, it *cannot* be assumed that they will be taking advantage of it unless they are warned of an impending burst. This points up a major problem in the tactical use of nuclear weapons. Unit SOP's must provide for a fast, effective warning system which will reach everyone in the affected areas. The difficulty of warning all personnel can be appreciated if the various activities going on in the forward battle areas are visualized.

Messengers, wire crews, litter bearers, aid men, and others must move about frequently in the performance of their duties. Often they may not be in the immediate vicinity of troop units when warning of an impending nuclear attack is passed. Small detachments of combat support troops, such as engineers, may be working in isolated areas where they may be subjected to casualty-producing effects if they are not warned. Effects that are completely tolerable to troops in tanks or foxholes can cause considerable casualties among those in the same area who are in the open. Army and Air Force pilots operating aircraft in the area must be warned since dazzle effect can be a serious problem to the pilot of any airborne aircraft.

Tactical Situation Paramount

The risk the commander is willing to impose on his troops will vary with the tactical situation. Naturally, he will desire to keep the level of risk as low as possible, and yet not reduce greatly the effects of his nuclear weapon on the enemy target. Therefore, the commander (and his staff) must be familiar with the effect that the selection (or recommendation) of a degree of risk and associated personnel vulnerability condition may have on personnel and equipment and, therefore, the operational effectiveness of the unit.

The announced or implied degree of risk is based in part on the advice and recommendations of the nuclear weapons employment officer and other staff members for each situation. Factors which are considered include troop dispositions and locations, horizontal and vertical errors of the delivery system, weather and atmospheric conditions, troop training and indoctrination, and the individual and unit protective measures in effect or contemplated, as well as tactical necessity which is probably the most important factor to be considered in troop safety.

Familiarity with the qualitative definitions of degree of risk and personnel vulnerability conditions enables the commander quickly and easily to give proper guidance for his troop safety requirements. It is normally unnecessary for the commander to specify the percentage assurance of not exceeding the acceptable degree of risk. It will be assumed that he wants a *very high* assurance unless he states otherwise. An assurance of 99 percent is considered a *very high* assurance for troop safety purposes.

An example of troop safety guidance, stated in a completely qualitative form, which could be used by the commander when his staff is as yet unfamiliar with his policy on troop safety, could be: "I desire a *very high* assurance that protected and warned troops in forward positions be subjected to not more than a moderate risk."

Incidentally, such phrasing carries with it the requirement that affected troops be in a warned and protected status. If the state of training of the troops or the state of communications is such that a *warned and protected* status is not a good assumption, the status might have to be lowered to *warned, exposed* or even to *unwarned, exposed.* In any event, the commander will know the state of training of his troops and how well they adhere to SOP regarding protective measures to be taken when warned, *and* the reliability and coverage of his communications when he announces his troop safety requirement.

At the other extreme, the commander's troop safety requirement may be announced merely as "SOP" with a requirement that he be approached for a decision if it is not possible to comply with the SOP. From experience gained in field operations or from battle experience, the commander's general policy for troop safety will evolve and can become a matter of routine. This is not to say that the commander cannot state his troop safety requirement completely every time. In what form it will be stated is strictly up to the commander concerned. It will vary, and will be as detailed or as general as he believes necessary or available information permits.

Contingent Requirements

Residual hazards to include fallout and induced contamination will be discussed first.

Guidance with respect to fallout contamination from our own employment of nuclear weapons is fairly simple. It will affect the analysis because it affects the height of burst selection which, in turn, affects casualties in and damage to the target. There are basically two situations:

1. Fallout is desired.
2. Fallout is not desired.

The commander may want to use fallout as a weapon when attacking targets deep in enemy territory. Fallout expected to cover large numbers of enemy troops, while at the same time creating no hazard for us, is one of the most damaging ways in which a nuclear weapon can be used. There will be some restrictions imposed by higher headquarters, since fallout from surface bursts may extend well beyond the area of operations of the command contemplating the use of fallout as a casualty producer or as a barrier. The difficulty of controlling fallout and the political and humanitarian factors associated with its use require extreme caution. Fallout is intentionally employed only when specifically directed by the commander. Surface or subsurface bursts, as appropriate, should be ordered. In this connection there should be a reasonable assurance that friendly or neutral areas will not be subjected to significant levels of radioactive contamination.

When employing nuclear weapons close to friendly forces, fallout will generally *not* be desired. There may be some exceptions to this in defense or retrograde operations, if wind conditions are favorable and are expected to remain so. In most cases, however, the commander will want to be *very highly assured* that militarily significant fallout *will not* occur. In those cases where a commander particularly wants to avoid fallout contamination, he should ensure that the staff is well-informed as to his wishes. If a commander fails to state the required assurance of no significant fallout, the nuclear weapons employment officer in his selection of a recommended height of burst will use a *very high* assurance, that is, a 99 percent assurance that no significant fallout will occur. In those cases where the commander is willing to accept a lesser assurance than 99 percent, for example, to obtain bonus damage to materiel, he should require a fallout prediction as a part of the target analysis. This could well be a matter of SOP.

The problem of induced contamination resulting from air bursts deserves some attention. It is possible to raise the burst height so high that this effect is negligible or nonexistent; however, doing so will mean that a great deal of weapon effects are wasted and comparatively little or even no casualties or damage will occur. If the situation is such that it is essential for friendly troops to enter the vicinity of the ground zero area shortly after the burst and stay there (example situations are airborne, amphibious, or river crossing operations), the solution is either to:

- Accept as a nuisance the contaminated area, wherein troops should stay for a limited period of time, or avoid or traverse as quickly as possible as far from ground zero as practicable.
- Offset the desired ground zero and use a larger weapon.

Specific Restrictions

Guidance may include appropriate statements concerning specific restrictions relative to the use of nuclear weapons or their effects. Such guidance may include one or more of the following conditions:

1. There will be no major obstacles to ground movement in certain areas, for example, tree blowdown, fires, rubble.
2. There will be no casualties or damage to a particular installation or area.
3. Bonus damage (damage which is desirable but not essential for success), if attainable while meeting the primary requirements for troop safety and for casualties and damage.
4. Certain allocated weapons, or a certain portion, will be retained as a reserve —the number will be influenced by the allocation itself, the duration (and phases) of an operation, the mission, strength of opposing forces, and probable future targets. This nuclear reserve does not have the same flexibility as nonnuclear fires but can be shifted with greater ease than can

XUM

NUCLEAR WEAPONS EMPLOYMENT OFFICER'S CHECKLIST

1. RECOMMENDATIONS

   a. Weapon.

   b. Delivery system.

   c. Height of burst.

   d. Desired ground zero.

   e. Time of burst.

   f. Estimated results.

   g. Troop safety precautions.

2. MISCELLANEOUS

   a. Weapon priority established if more than one weapon meets the commander's guidance.

   b. Appropriate recommendation made if requirements in commander's guidance conflict.

   c. Fallout plot, if required.

✓ CHECKLIST

FOR

COMMANDERS AND NUCLEAR WEAPONS EMPLOYMENT OFFICERS

COMMANDER'S GUIDANCE CHECKLIST

1. CASUALTIES AND DAMAGE (nature, extent)

2. TROOP SAFETY (degree of risk, personnel vulnerability, special precautions)

3. CONTINGENT REQUIREMENTS (fallout, induced contaminaton, tree blowdown, fires, rubble, bonus damage, unwanted damage, restriction on use of weapons, retention of a reserve)

EXAMPLE 1:

"I want about one-third casualties at one hour with no more than a moderate risk to warned, exposed personnel in forward positions. Try for bonus damage to materiel. I want no significant fallout, and minimize induced contamination and tree blowdown on highway— which will be used extensively by friendly combat and support units. Use no more than two nuclear weapons on Aggressor frontline targets."

EXAMPLE 2:

"Use not more than one-half of allocated weapons to ensure rupture by destruction of initial Aggressor positions and to neutralize his local reserves. Retain a sufficient reserve to engage deep targets exclusive of those used to attack preplanned targets and for future contingencies. I desire no more than a moderate risk to friendly troops except where nuclear radiation governs; then I want no more than a negligible risk. Ensure minimum residual radiation in order not to interfere with or impede our maneuver. Avoid civilian casualties unless military considerations are paramount; I desire to approve personally any attacks of population centers over_____. My personal prior approval is required for the use of deliberate surface bursts, and the acceptance by subordinate commanders of a troop safety risk other than that which I have directed."

a reserve of troops to defeat counterattacking enemy local reserves, or to attack on-call targets and targets of opportunity. Nuclear reserves may have to be employed piecemeal on the basis of less information than has been expected previously to maintain or restore the momentum of the attack.

Conclusion

Nuclear weapons will be in limited supply in the foreseeable future. Political, moral and humanitarian influences, and mutual restraint will further preclude the unrestricted use of nuclear weapons. These factors will permit only discriminatory use of appropriate nuclear weapons systems to inflict the required degree of controlled destruction on selected targets of military significance at the critical time and place for battle-winning effectiveness.

Like the principles of war, the commander's desires for casualties and damage, troop safety, and contingent requirements will conflict. The commander (and staff) must recognize and accept these situations and plan the employment of nuclear weapons with as much care, thoroughness, and consideration as is devoted to the employment of major tactical units.

We are opposed by the heavily armed, resourceful, and implacable Communist conspiracy which has repeatedly stated that its basic aim is to spread communism throughout the world, destroying everything which stands in the way—including—and most particularly—the United States of America.

To defend ourselves against this threat, we must be able to react quickly to a wide range of hostile possibilities. We must bend every effort and resource at our disposal toward the development of a deterrent force which is so real and powerful that no aggressor would dare aim an initial offensive blow against us. This calls for military forces-in-being which can react instantaneously and effectively at any time or place and with whatever power is necessary to achieve quick and decisive victory.

* * * * * * *

The United States Army is expected to play an indispensable role either in general or limited war. The Army must be able to deal with the whole broad spectrum of warfare—ranging from contrived incidents to all-out atomic attack. Our Army today is a fighting force which is built to fit the pattern of the space-atomic age. It is balanced, versatile Army, equipped with modern, mobile, and tremendously powerful missiles with atomic capability. It also has an arsenal of splendid conventional weapons tailored to its precise needs. It is able to support national policy with a small detachment or a field army of many divisions, as the situation might require. It can fight effectively throughout the whole gamut of conflict, from a conventional patrol action to operations on a vast atomic battlefield, thousands of square miles in area.

Secretary of the Army Wilber M. Brucker

XUM

MILITARY NOTES AROUND THE WORLD

UNITED STATES

'Nike Zeus' Progress

The ultrasupersonic surface-to-air antimissile missile, the *Nike Zeus*, is planned for initial firing during calendar year 1960. It will be powered by a solid propellant rocket engine capable of generating 450,000 pounds of thrust. Both the booster and the sustainer motors of the *Zeus* have been fired successfully in static tests. Unique features of the big sustainer motor of the *Zeus* include an unusually efficient motor case with extremely thin walls, special high energy propellants, and a nozzle made of plastic which is said to have sustained thousands of degrees of heat with perfect results. —News item.

Satellite Launcher

The *Scout* four-stage solid propellant rocket is designed to launch satellites weighing 150 pounds into orbit 300 miles above the earth. The vehicles, which cost a relatively modest half-million dollars each, use a simplified gyrocontrol. In addition to serving as a satellite launcher, the *Scout* also can function as a ballistic probe, lifting a payload of 100 pounds to altitudes of more than 5,000 miles. Initial firings of the *Scout* are planned for 1960 from the Wallops Island rocket test center.—News item.

Variable Depth Sonar

A new sonar technique for fleet destroyers permits the detection of submarines which, in the past, have been undetectable below the oceanic "thermal barrier." The technique permits the lowering of equipment hundreds of feet down into the ocean past the barrier created by a marked temperature change in the water.

It has been reported that many fleet destroyers will be equipped with the variable depth sonar to supplement their long-range, hull-mounted equipment.—News item.

Heat By Chemicals

A soldering iron heated by chemicals has been adopted by the Army for emergency use where power for heating an electric soldering iron is not available. The soldering iron is heated by a chemically charged cartridge placed in a chamber in the copper tip of the iron, and actuated by a firing pin mechanism mounted in the handle.

During the burning of the chemicals no gas is released and no explosion occurs. The iron is heated about 30 seconds after the cartridge is actuated and retains its heat for from five to 10 minutes. —News item.

Variable Height Bridge

A variable height pier for use in speeding the erection of tactical bridges and to reinforce civilian bridges for military loads has been developed. The pier can support a 150-foot span triple truss tactical bridge, and can be erected to the desired height under varied site conditions.

Components are designed for ease of fabrication and erection, and are sufficiently rugged to withstand field usage. The five-ton military bridge truck and the 2½-ton cargo truck are adequate to transport all elements of the bridging set.—News item.

Amphibious Helicopter

Described as the world's largest amphibious helicopter, the *HSS-2* is powered by two 1,050-horsepower gas turbine engines and is the Navy's first helicopter with all-weather characteristics. The *HSS-2* will operate from the deck of an

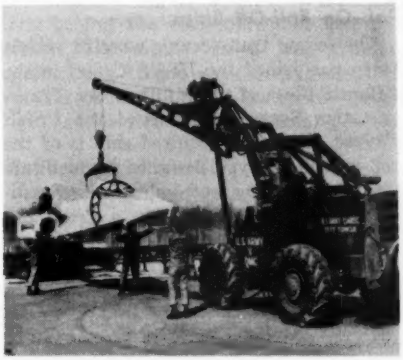
US Navy Photo

HSS-2 all-weather helicopter

aircraft carrier in its planned mission of hunting out and destroying enemy submarines. It is equipped with heavier sonar devices than other such aircraft on antisubmarine duty, and its armament will include conventional as well as atomic depth charges.—News item.

Missile Support Vehicle

A multipurpose vehicle currently under test is designed to reduce operating costs and simplify the handling of Army missile components at launching sites. Originally developed as a rough terrain forklift truck, the versatile vehicle has a lifting capacity of five tons as a forklift. It can pull 19,000 pounds as a tractor or handle a 10,000-pound load with its slewing crane boom. The vehicle has front and



Forklift-crane assembles *Nike Hercules*

rear axle steering and a side-shifting device that permits the forks to move as much as two feet to either side of center to pick up offcenter loads. The dual-axle steering enables the vehicle to move sideways at a 20-degree angle. If adopted, the vehicle will perform the work of several single-purpose vehicles at each missile launching site.—News item.

'Vega' Rocket

Test flights for the three-stage *Vega* rocket are expected by late 1960. The 147-ton *Vega* will consist of an *Atlas* intercontinental ballistic missile for the first stage, a *Vanguard* satellite launching booster for the second stage, and a rocket now under development for the third stage. The *Vega* program contracts are for about 76 million dollars and call for the

production of eight rockets by the end of 1961. Capabilities of the big rocket include placing a 5,000-pound satellite in orbit at an altitude of 200 miles, or launching a manned space laboratory into a 300-mile orbit. Both of these capabilities would be accomplished with two stages. The *Vega* also could place a 1,000-pound payload in the vicinity of the moon or launch a 750-pound payload on a planetary mission.—News item.

Roll-On Roll-Off Ships

The second transoceanic wheeled vehicle ferry has joined the *USNS Comet* in the Atlantic Fleet of the Military Sea Transportation Service. Christened the *USNS Taurus*, the newly acquired ship is of the roll-on roll-off type designed to facilitate the rapid loading and unloading of military cargo. The *Taurus* has a gross tonnage of 8,050 tons and an over-all length of 475 feet.

The Army has estimated that approximately 25 percent of its cargo shipped overseas rolls on wheels or treads and is suitable for loading on this type of ship. Statutory authority has been granted for the procurement of a total of five roll-on roll-off vessels, but funds for their construction were not requested by the Navy in the 1960 budget.—News item.

Internal Combustion Catapult

The aircraft catapults of the nuclear carrier *Enterprise* will be of a new design using internal combustion rather than steam. The catapults consist of a combustion chamber in which a combination of jet fuel, air, and water are fired, driving a piston down a long tapered chamber. A trolley attached to the piston hurls the aircraft into the air. The new catapult is said to provide 50 percent more power than steam catapults. It also gives the pilot of the aircraft a smoother ride and takes up considerably less space than the older models.—News item.

Antisubmarine Weapons

The *Mark 44* antisubmarine torpedo is a small lightweight missile that automatically seeks its target. It is designed with the capability of attacking fast targets traveling at great depths, and can be launched from surface vessels or from aircraft. When launched from an aircraft, a small parachute guides the torpedo on its descent to the water. Upon reaching the water surface the parachute is released automatically and the torpedo begins to seek the target.

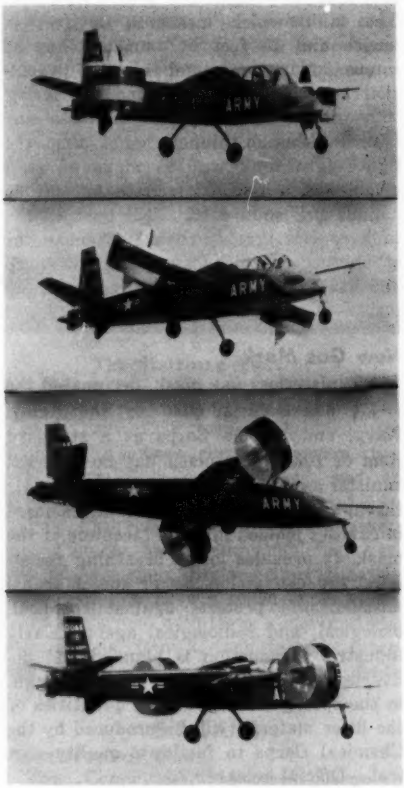
Other recently disclosed antisubmarine warfare developments include a small nuclear depth charge, and research into the possibility of using the *Lobber* logistical missile (MR, Jan 1959, p 76) for antisubmarine warfare applications. The nuclear depth charge is called *Little Lulu*. No other information on this weapon has been made available. The *Lobber* missile is being considered for use in launching depth charges and for placement of sonobuoys or flares.—News item.

US Navy Photo

***Mark 44* torpedo in aerial launching**

Ducted Fan Airplane

The Doak *Model 16* VTOL aircraft (MR, Jul 1958, p 64), which has been given the Army designation of *VZ-4DA*, has been flight tested in full conversion



Test model of *VZ-4DA* in conversion from vertical to horizontal flight

from vertical to horizontal flight and back to the vertical configuration for landing. Propulsion for the aircraft is provided by two wingtip-mounted ducted fans which can be rotated through 90 degrees. Pointed straight up, the fans provide lift which permits the raising or lowering of the airplane without the use of a runway. After vertical takeoff the fans are tilted forward and the *Model 16* then operates as a conventional aircraft. For a vertical landing the ducted fans are rotated back to the vertical position. The aircraft also can take off or land as a conventional airplane with the fans in position for horizontal flight.

The test model of the aircraft is powered by a single 840-horsepower *T53* shaft turbine engine mounted in the fuselage behind the seats for pilot and observer. The engine has a long tailpipe ending in a hinged vane arrangement to provide control during low-speed operation and vertical flight.—Official release.

'Superhawk' Planned

A second generation of the *Hawk*, the Army's surface-to-air missile designed for medium- and low-altitude use, is being planned and will be known as the *Superhawk*. Component parts of the *Superhawk* are already in existence. The *Hawk*, which has intercepted supersonic jet aircraft at treetop height as well as up to levels of about 50,000 feet, will undergo a series of cold-weather trials during the winter of 1959-60. It is planned that 15 *Hawk* battalions will be equipped by Fiscal Year 1962. The *Hawk*, which weighs 1,250 pounds at launching and reaches a speed of nearly Mach 3 at rocket burnout, can operate at slant ranges of up to 22 miles. —News item.

Project 'Chariot'

Currently under exhaustive study is a plan known as Project *Chariot* which envisages the use of five hydrogen bombs to blast a harbor near Cape Thompson in Alaska, just north of the Arctic Circle and only 175 miles across the Chukchi Sea from the Soviet Union. The shots would be fired about 300 to 400 feet beneath the surface which would confine the major portion of the fission products.

XUM

The plan is to fire one bomb near the beach to carve out a channel; the other four hydrogen detonations would be grouped about three-quarters of a mile inland to form the harbor basin. Two 880-foot shafts are being sunk to determine the nature of the subsurface rock. The study is expected to be completed in about a year.—News item.

'Atlas' Progress

The big *Atlas* intercontinental ballistic missile will be stored in a horizontal position at operational sites, in contrast to the research and development test sites where the missile has been kept upright on the launching pads. The erecting and launching equipment is designed to permit the missile to be fired in the shortest possible time. The erecting mechanism is a tilting tower which picks up the missile as it lays on its side and brings it to the vertical firing position in about two minutes. The system is powered by a 75-horsepower electric motor.

***Atlas* rising to firing position**

It also has been announced that the fuel tanks of the *Atlas* are made from a lightweight but tough stainless steel skin that must be pressurized to hold its shape. The tank, which measures 60 feet in length and 10 feet in diameter, has no internal framework, and from the propulsion section to the nosecone the *Atlas'* thin tank walls form the complete airframe. Although thinner than a dime, the lightweight tank wall is made of steel which has a tensile strength of 200,000 pounds per square inch. No part of the tank wall is greater than 40-thousandths of an inch in thickness, but its strength and stability have been proved in many tests.—Commercial source.

New Gas Mask

A canisterless gas mask, designated the *M-17*, has been adopted by the Army, Navy, and Marine Corps as a standard item of issue. The mask has no external canister as in previous models, filtering air through pads of pliable material enclosed in cavities molded into the facepiece of the mask. It provides lower breathing resistance, superior vision, better speech transmission, and protects against chemical, biological, and radiological agents. Early industrial production is planned and deliveries to the armed services will begin in the spring of 1960. Initial quantities of the filter material will be produced by the Chemical Corps to facilitate quality control.—Official release.

INDIA

Indian-Designed Aircraft

The first four-seat light aircraft of Indian design has made its initial test flights. The aircraft, a high-wing monoplane of conventional configuration, is to be used for training and agricultural purposes, but is also equipped for the medical evacuation role.—News item.

JAPAN

Shipbuilding Program

The Japanese Maritime Self-Defense Force shipbuilding program for 1959 includes 10 vessels of which two will be escorts of 1,450 tons each, two new type 750-ton submarines, three *Umitaka* class subchasers, two *Kasado* class minesweepers, and a 1,250-ton submarine rescue

The destroyer *Yudachi*

vessel of a new type. The contracts for Fiscal Year 1958 vessels included two 1,700-ton *Ayanami* class destroyers, two subchasers, four minesweepers, and an aircraft rescue boat.

Two *Rain* class destroyers, *Murasame* and *Yudachi* have been completed. Vessels of this class displace approximately 1,800 tons and have a speed of 30 knots. They are armed with three 5-inch and two 3-inch guns, four 21-inch torpedo tubes, and two *Hedgehog* antisubmarine depth charge launchers.—Official release.

BELGIUM

Joint Nuclear Unit

The Commission of the European Atomic Energy Community (Euratom) and the United States Atomic Energy Commission will have equal representation on a joint United States-Euratom research and development board, the headquarters of which will be located at Brussels. The board particularly will concern itself with the evaluation, technical guidance of construction work, and research on nuclear reactors.—News item.

TURKEY

First Reactor Planned

Turkey's first nuclear reactor will be in operation in two years. The reactor is to be constructed under the United States-Turkish agreement for the peaceful applications of atomic energy. Among other things, it will be used for research in the fields of medicine and agriculture.—News item.

CANADA

Joint Space Project

Canada and the United States will join in a cooperative research program for exploring the ionosphere over the Arctic with rockets and satellites. Under this program, the United States will provide Canada with several *Aerobee-Hi* research rockets to be fired from the Fort Churchill launching site on Hudson Bay. The rockets will test equipment to be used later in a United States-launched satellite containing a scientific payload designed and built in Canada.—News item.

Nuclear Fuel Donated

Three tons of natural uranium have been donated by Canada to the International Atomic Energy Agency. The fuel is planned for use in the Japanese nuclear research reactor.—News item.

Warships Join Fleet

Having been refitted extensively, the destroyer escort *Micmac* and the frigate *Lanark* have rejoined the Royal Canadian Fleet. The *Micmac* is an improved *Tribal* class vessel of 2,800 tons displacement. Vessels of the *Tribal* class carry four 21-inch torpedo tubes and two *Squid* triple-barrel depth charge launchers, and are capable of a maximum speed of 36.5 knots.

The *Lanark* is a *River* class frigate escort vessel of the same type as the three vessels loaned by Canada to Norway in 1956 and later officially transferred (MR, Mar 1959, p 86).—News item.

GREAT BRITAIN

Advanced Missile Ordered

A high performance surface-to-air missile, a developed version of the operational *Bloodhound* system, is planned for the use of the British air defenses. The new missile is to have a substantially increased operating range and height, a greater lethality, and an improved capability of operating against low-flying targets. The *Bloodhound* missile, now in use by the Royal Air Force, is ramjet-propelled and has a reported speed of Mach 2.5. It is 25 feet long, has a wingspan of more than nine feet, and is said to weigh about 4,500 pounds maximum. The two 16-inch-diameter *Thor* ramjet engines of the *Bloodhound* are reported to have a thrust of 5,000 pounds each. The operational range of the *Bloodhound* has been estimated as about 60 miles.—News item.

Reactor Systems

The British Admiralty is considering the relative merits of eight competing nuclear reactor systems for marine propulsion. The systems have been proposed by the United Kingdom Atomic Energy Authority (a governmental agency), and seven independent groups.

At least two of the reactors considered are available for immediate application without further development. One of the reactors is a high-temperature, gas-cooled model which would be able to be fitted into ships too small for other types of reactors. —News item.

Tailfirst Bomb

The *Blue Steel* is an air-to-surface bomb intended as primary armament of the *Vulcan* and *Victor* bombers which will carry it partially enclosed in their bomb bays. The weapon has a tailfirst airplane configuration, and is controlled by pivoted delta foreplanes and inboard ailerons on its rear-mounted delta wings. The ventral fin folds to provide clearance during the takeoff of the launching bomber.

Details of the performance and characteristics of the weapon have not been released, but unofficial sources indicate that it will operate at supersonic speeds at heights up to 60,000 feet after release 400 miles from the intended target. It is reported to be powered by a *Double Spectre* liquid propellant rocket engine of about 16,000 pounds thrust.—News item.

Helicopter In Production

The *Bristol 192* twin-engine tandem-rotor gas turbine helicopter will enter service with the Royal Air Force next year. The *192*, which is more than 54 feet long, is designed to meet military requirements in troop and freight transport, search and rescue operations, and ambulance and supply functions. It can carry

Twin-engine *Bristol 192* helicopter

18 fully armed troops on a long-range operation and as many as 25 on short hauls. Its freight capacity is three tons, and it can carry a load of 5,250 pounds externally on a sling under the fuselage. The helicopter is powered by two *Gazelle* gas turbine engines. A synchronizing shaft keeps the rotors in phase and permits the big aircraft to operate on a single engine if necessary.—News item.

SWEDEN

Rocket Booster

The Svenska Flygmotor aircraft rocket booster engine *VR-3* is powered by jet fuel and hydrogen peroxide. It develops 5,700 pounds of thrust at 65,000 feet and is equipped with a single control lever for stopping, starting, and throttling.—News item.

FRANCE

Dual-Version Aircraft

A twin-engine aircraft which, in the commercial version will be called the *Communaute* and in military applications will be designated the *Spirale*, has completed initial test flights. The aircraft will be capable of carrying 10 passengers in either version, and is expected to have an operational range of 1,550 miles. The *Spiral*, in addition to its cargo-carrying capability, will be armed for military action with guns, missiles, and rocket launchers. The twin Turbomeca *Bastan* turboprop engines of the airplane weigh only 467 pounds each but develop 750 shaft horsepower. Models of this engine also are used in the *Epervier* (MR, Jun 1959, p 81) and the *SE.116 Voltigeur* (MR, Nov 1958, p 79).—News item.

Defense Community

The French Community, grouping France and 12 autonomous African republics, has set up a service of external security. This service is to be at the disposal of each participating state for assistance when the state is threatened from the outside. The service will operate under the French Community Committee; the military forces placed at the disposal of the states would be under French command.—News item.

Turbo-Ramjet System

The experimental turbojet- and ramjet-powered aircraft *Griffon II* utilizes a unique combination of the two types of powerplants with the turbojet engine centrally mounted inside the main ramjet powerplant. The entire propulsion system of the *Griffon* weighs only 3,740 pounds, yet the aircraft has reached a speed of more than twice the speed of sound in test flights, and has set a world's record for a 100-kilometer closed-circuit course with a recorded speed of 1,638 kilometers (1,000 miles) an hour.

The turbojet engine used is a Turbomeca *Atar 101-E3* with a thrust of 7,700 pounds. The ramjet, which houses the turbojet powerplant, is 4.5 feet in diameter. An advanced model of the *Griffon* is under development which is predicted to have a speed of Mach 3 at altitudes between 66,000 and 80,000 feet and will have a hitherto unapproachable maneuverability at very high altitudes.—News item.

Fallout Warning System

An alarm system of approximately 3,000 measuring stations is being set up in France to provide immediate warning if radioactive fallout from nuclear tests reaches the danger level.—News item.

Antisubmarine Aircraft

The first production model of the *1050 Alizé* antisubmarine aircraft (MR, May 1958, p 69) is now flying. The three-seat carrier-based *Alizé* is powered by a *Dart* turboprop engine and has a top speed of about 250 knots. The French naval service has ordered 75 of these aircraft for fleet use.—News item.

AUSTRALIA

Vessels Recommissioned

The Australian-built frigates—the *Diamantina*, *Gascoyne*, and *Barcoo*—which have been out of service for some time are to be recommissioned. They will perform coastal survey duties with the fleet. These vessels, all of the *River* class, displace 2,220 tons and are capable of a speed of 20 knots. They are said to be armed with the latest in antisubmarine equipment and will replace the minesweepers *Freemantle* and *Cootamundra* and the training destroyer *Warramunga* in fleet service.—News item.

American Arms

Australia has purchased nearly nine million dollars worth of military supplies from the United States to increase the

XUM

mobility of the Australian forces and to bring Australian Army equipment more in line with that of the United States. Among other items purchased were two United States medium landing ships that have been in mothballs in Japan for the past two years.—News item.

Research Rockets

Rockets used for research in firings from the Woomera test range include the *Long Tom* and the *Aeolus*. Both of these rockets have attained altitudes of more than 100 miles. The 27-foot *Long Tom* weighs about a ton and has reached a speed of 4,000 miles an hour.

The *Aeolus* weighs half a ton, is 21 feet long, and has a speed of 3,000 miles an hour. They carried 50-pound payloads of instruments which were parachuted back to earth after the rocket flight.—News item.

NEPAL

Air Services Developed

Nepal is to receive five aircraft, including three *DC-3's*, under a recent agreement in which the United States has promised the Nepalese Government $600,000 in aid to help develop that nation's air services. Other assistance will be navigational and communications equipment for airfields, including one field at an elevation of 13,000 feet near the Nepal-Tibet border.—News item.

GUINEA

Equipment Gifts Received

Three ship cargoes of military equipment have been received by Guinea from countries behind the Iron Curtain. Among other items, these shipments reportedly included a number of Czechoslovakian rifles, the number of rifles varying from 2,000 to 8,000; three armored cars; a military field kitchen; and two light tanks.—News item.

THE NETHERLANDS

Submarine Design

The recently launched submarine *Dolfijn*, due for sea trials later this year, has a revolutionary hull design to make it less vulnerable to depth charges. The hull of the *Dolfijn* consists of three cylinders arranged in a pyramid shape and covered with a steel hull. The upper cylinder contains the navigational equipment, armament, and living quarters for the vessel's 63-man crew. The lower cylinders house the propulsion mechanism containing diesel engines of about 5,000-horsepower. The submarine will have a speed of about 17 knots either on the surface or submerged. It displaces 1,480 tons submerged and is armed with eight 21-inch torpedo tubes.

A sister ship, to be named the *Zeehond*, is under construction. The building of two other underseacraft of this class, the *Potvis* and the *Tonijn*, have been suspended.

According to *Jane's Fighting Ships 1958-1959*, these latter two vessels will be changed radically in design and will be completed as nuclear-powered vessels.—News item.

WEST GERMANY

Production Agreement

The West German Defense Ministry has concluded negotiations for permission to manufacture the British *Orpheus 803* turbojet engine. This engine is used in the NATO *Fiat G-91* lightweight tactical strike aircraft which also will be produced in West Germany.

According to the report, the *Orpheus* engine, rated at 5,000 pounds thrust, is specified as the powerplant in 14 different types of aircraft, including those of France, Great Britain, the United States, Japan, and Italy.

Agreements also have been made for its manufacture in France, Italy, and India.—News item.

USSR

Versatile Turboprop

The Soviet four-engine turboprop transport *Ukraina* (NATO code name, *Cat*) is reportedly able to operate from small unsurfaced airfields. In a recent test it took off from a dirt runway with a load of 85 passengers, climbing to 25,000 feet in 12 minutes. The big aircraft, which weighs 121,500 pounds fully loaded, is powered by four *NK4* turboprop engines of 4,000 horsepower each. It carries a crew of five and has accommodations for 100 passengers. It can attain a top speed of 483 miles an hour and has a maximum range of 2,128 miles carrying a load of nine tons. Its range with a full load is about 1,240 miles.—News item.

Solar-Powered Signals

The Soviet satellite, *Sputnik III*, launched on 15 May 1958, completed more than 5,000 revolutions around the earth during its first year in orbit. At the end of that year it was still radiating signals from energy supplied by solar cells.

The United States satellite, *Vanguard I*, also powered by solar cells, has been emitting signals steadily since it was launched on 17 March 1958. The *Vanguard I* satellite is expected to have a life span of approximately 2,000 years. Systems of much greater power than that required to operate the radios of *Vanguard I* are said to be well along in the developmental stage.—News item.

Army Air Force

The Soviet Army Air Force has been estimated to account for about 70 percent of the operational military aircraft in the Soviet Union. It includes about 685,000 personnel for the mission of close support of ground operations. Liaison officers of the army air force are attached to ground force commands to assure proper radio communications.

Aircraft of the Soviet Army Air Force include *Yak-23 Flora* fighter-bombers, *Il-28 Beagle* and *Beast* light bombers, and the *Yak-12 Creek* and the *An-2 Colt*.

The *Creek* has been developed in several versions, the latest of which is known as the *Creek-C*. This aircraft, which has been called the Soviet's leading light plane, is a typical four-seat cabin aircraft with a wingspan of 39 feet and a top speed of 125 miles an hour. It has been used as an ambulance, air observation post, glider tug, and military liaison aircraft.

The *Colt* is the only biplane of modern design in wide military and civil use today, and over 2,000 of these aircraft have been produced for use with the Soviet armed forces. It has been exported to a number of satellite nations, including East Germany and Bulgaria, and also is under construction in Communist China. Several versions of the *Colt* exist, but in the military version it can carry cameras for photographic missions or transport about 12 passengers or paratroopers. It has a wingspan of 54 feet and a maximum speed of 155 miles an hour.—News item.

Plastic Vessel

The Soviet Union has launched a plastic hull, diesel-driven freighter. Details on the type of plastic used in the vessel were not released, but it is said to be as strong as any metal, but only one-third the weight of a normal steel hull.—News item.

Antarctic Development

The Soviet Union has joined 11 other nations in agreeing to respect the nonmilitary development of the Antarctic region. A 12-nation conference is planned for October 1959 at Washington, D. C., with the aim of preparing a treaty concerning the peaceful developments of Antarctica. Besides the US and the USSR, nations to attend include Argentina, Australia, Belgium, Chile, France, Great Britain, Japan, New Zealand, Norway, and the Union of South Africa.—News item.

XUM

MILITARY DIGESTS

Unification by Evolution

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel A. Green in the "Australian Army Journal" November 1958.

There are several concepts of unification.

We may think of unification as, basically, the grouping of the three service departments and perhaps supply under one political head, leading to ultimate and complete amalgamation.

A second concept is that of unification of the higher command and the staffs at the highest level.

Another school of thought advocates primarily the unification of the logistical and administrative system because of the efficiency and economy which obviously would ensue.

Still another belief is that the three services should first be completely combined, and then reorganized horizontally, with separate agencies for the main functions of logistics, personnel, and operations.

British Organization

The modern British defense organization derives its origin from the Esher Report of 1904 which created the committee of imperial defense and the chiefs of staff committee and, in 1937, it appointed a minister for the coordination of defense. It was not until 1940, when Mr. Churchill became Minister for Defense as well as Prime Minister, that an effective central defense organization emerged. He, of course, imposed an unprecedented degree of unified control with joint service planning, which he executed by means of two committees—one for operations and the other for supply. The operations committee, acting on the advice of the chiefs of staff, primarily was concerned with issuing operational instructions and strategic guidance which the three fighting services then implemented in day to day orders and action.

In the field of higher command and political direction of war there arose, therefore, in the British system, a certain degree of coordination by committee which is fundamentally coordination by compromise. A new trend emerged later in the system of supreme command adopted in Europe and Southeast Asia which was essentially due to American influence.

Since World War II the patterns of defense organization in the United Kingdom and Australia have been similar—a minister for defense with a chiefs of staff committee and a joint staff (a joint planning staff and a joint administrative staff) coexistent with equal and independent service departments, each under its own minister and chief of staff.

The present British system has been described by Lord Tedder as "unitarian at the top and trinitarian all the way down." The British Prime Minister himself basically is responsible for defense. He has a

defense committee and a minister for defense. Originally, the primary duties of the minister were the allotment of supply and certain common administrative policies and interservice organizations such as the Joint Intelligence Bureau and the combined operations organization. Under this system the chiefs of staff were essentially joint, and they were served by joint staffs. There was a degree of coordination in budgetary matters and certain inquiries were pursued into common administrative questions, especially personnel, supply, and mutual medical interests.

British defense policy underwent a profound change as a result of the nuclear threat and the need for national economy when Mr. Duncan Sandys took over. His main task was to make economies in money and manpower and reorganize the services in the light of nuclear missile warfare. He was empowered to make decisions on the size, the shape, and the dispositions of British forces, and on certain matters of equipment, supply, pay, and conditions of service. Furthermore, he was to make decisions on administrative functions common to the three services. He also proceeded to appoint a permanent chief of staff to preside over the joint chief's committee.

New British Organization

After 18 months of operation and considerable introspection, the British organization was reviewed, and, in the main, confirmed. At the same time new features were introduced as follows:

1. A cabinet defense committee which is to be as flexible as the Prime Minister may require. The members thus may be convened as the subjects to be discussed affect their particular responsibilities, and the chiefs of staff will be in attendance. They also may be invited to attend full meetings of the Cabinet.

2. A defense board has been established to facilitate consultation on interservice policy subject to the minister of defense.

3. The minister of defense is responsible ministerially to the Prime Minister for the execution of military operations.

4. A new post of chief of the defense staff has been created. The chief is principal military advisor, responsible to the minister of defense.

a. The chief of defense staff, with the service chiefs of staff, constitute the chiefs of staff committee. They are responsible, through the chief of defense staff, to the minister of defense for the conduct of military operations.

b. The joint planning staff is, in its collective capacity, directly responsible to the chief of defense staff who can call on the service chiefs of staff to assist him when their respective staffs are regarded as a joint defense staff.

The British Government has eschewed any abrogation of the constitutional responsibilities of the individual service ministers, and it has avoided the cleavage between planners and executors which occurred under the German Armed Forces High Command (OKW) system. The revised system represents careful and moderate progress, and is probably an intermediate stage toward unification. It makes an interesting comparison with the latest American reorganization.

American Organization

American unification derives its origins from legislation promulgated in 1946. This brought into being a National Military Establishment under the Secretary of Defense. The apparent aim of this law was to produce a weak federation, and not a merger of the fighting services in which the Secretary of Defense would supervise the independent services. The services themselves would execute the policies which they had agreed upon. There has been a considerable evolution from this point since 1946.

In 1949, presumably emboldened by the progress which had been made by the unification law, the aim of unification was

XUM

modified and a centralized civilian authority was sought in one executive department. This was to be discharged through the Department of Defense which would be responsible for basic policy, for its subsequent direction and control would be responsible for the elimination of duplication and overlap between the services, and furthermore would act as the over-all budgetary authority. At this point a great controversy arose between the Navy and the Air Force. It was caused by their conflicting policies, since the Navy had embarked on an ambitious aircraft carrier building program of the 60,000-ton type carrier, the *USS United States*; on the other hand, the United States Air Force had embarked on a nuclear bomber program founded on the *B-36* bomber. Controversy between proponents of the two policies waxed furiously and disturbed the services to such an extent that a special congressional inquiry sat to elucidate the causes for it and the rights of the case. The lucid report which was issued is, incidentally, one of the best source documents that can be read on the subject of unification.

Public interest was fanned by press campaigns and political lobbying, as well as direct public pronouncements by service chiefs. During the inquiry the aspects of aviation which were among the major subjects under discussion were most complex, including problems of naval, marine, carrierborne, strategic, and close-support aviation.

The general result of this partisan development was regression from the concept of unification under a central civilian authority, and in 1953 a new basis of unification was promulgated. This insisted on a comprehensive defense program as was manifestly necessary. It also insisted that the policies and procedures of the three services should be integrated as far as was necessary, but it gave the three services a guarantee of their own entity as services, and it promised them that, for the time being anyway, there would be no outright merger. A major cause of the *B-36* controversy was that the United States Air Force had criticized the Navy's carrier program as though they were, in fact, experts on the problems of naval aviation and carrier operations and their strategic use. The right so to criticize another service was rejected, and, in fact, the right of each individual service to be the prime arbiter of what it needed, and the main advisors to government of what should be done in its own fields, was maintained. However, it was also decided that the three services should be under the effective over-all strategic direction of the Secretary of Defense. In practice, it meant that centralized unification had slowed up.

Regression

The new law emphasized that the chiefs of staff were joint although the Secretary of Defense would be responsible for fiscal matters in particular, and would be empowered to coordinate certain mutual fields including personnel and administration. At this time it was understood that there would be a new accent on integration; in strategy, which would include America's diplomacy; in technology and research; and in the basis of all warmaking—industrial mobilization. The main achievements of this second phase were not in fundamental coordination of the services, but in supplementary fields. The services began to educate one another in their similarities and their differences. Joint training was accelerated and personnel policies were coordinated to the point that they embarked on coordinated housing projects for their forces. There was a degree of unification in military law systems, medical effort was coordinated, and a uniform clothing allowance was introduced.

Integration of research progressed until the Navy openly admitted using rockets that had been developed by the other two

services. Procurement of subsistence was coordinated inasmuch as one service, the Army, was made the single manager for the purpose of procurement for the others.

The organization consisted of the Secretary of Defense, with joint chiefs of staff from the services to advise him, with their own chiefs of staff and their own operational commanders within higher commands such as NATO; also with their own logistical support. These are independent services with certain legal responsibilities; that is, the chief of the naval staff is legally and personally responsible for naval operations. This was, therefore, still a compromise system.

Recent Developments

More recently—presumably as a result of public concern at American technical progress in nuclear warfare and the growing public concern at the expense of the three services, since one-eighth of the national income of the United States goes to the fighting services—the President sent a message to Congress specifying certain reforms which he wished Congress to undertake.

The first of these reforms was that all the operational commands should be fully unified, although the services within them should not be merged. Rather, they would remain as individual services, but under the full unified command of the theater or supreme commander. Furthermore, there should be direct control of these commands by the Secretary of Defense, bypassing the service departments.

This meant that the Chief of Staff of the Air Force or the Chief of Naval Operations would no longer have operational control of their forces. In order to enable the Secretary of Defense to fulfill his new functions, the military staff in the Defense Department should be strengthened and the joint chiefs, instead of being merely the heads of committees, should become members of an integrated operational staff to direct the new unified commands. The great new role of the independent fighting services would be to undertake the administration, training, and logistical support of their own services.

Finally, the President asked for full overriding authority to be given to the Secretary of Defense, particularly in fiscal appropriations, in the distribution of functions between the three services, and in the political relations and public relations of the services. This latter presumably was to avoid any more controversies of the *B-36* type.

Last, but not least, he requested that the Secretary of Defense control certain important personnel matters, particularly all promotions to three and four star rank, and should have power to transfer officers between the three services as circumstances might demand. As we now know, Congress did not accede to all the President's requirements. At the lower level it concurred in the unification of operational command, but it demurred at the abrogation of the powers of the heads of the three services and the formation of a great unified operational staff in the Defense Department.

This uncompleted saga of American development is a continuing if fluctuating evolution and is full of warnings that unification must be tackled gradually and logically. Also, in view of Australia's close dependence upon America it may serve to remind us that unification is inevitable for ourselves also. Moreover, American unification has progressed further than the British.

Canadian Example

Canada has one minister of national defense, a chairman of the chiefs of staff committee and three service chiefs of staff. Thus there is real emphasis in the present Canadian system on a single defense policy. Canada, like Australia, has British Commonwealth antecedents and American alliances. She appears to have taken

XUM

very positive steps toward unification. Her example is, therefore, relevant.

Australian Developments

The Australian Parliament recently rejected service amalgamation on various counts, including that of the parliamentary difficulties which would be incurred. It also has rejected the horizontal-functional reorganization which was suggested from some quarters because it was felt that it would lack the necessary authority to execute its tasks.

However, it is understood to be our policy to establish the complete superiority of the department of defense. There has been appreciable progress in the appointment of a permanent incumbent as chairman of the chiefs of staff committee, to obtain comprehensive decisions, to make broad appreciations in matters affecting the three services, and to advise the minister and the defense department, as well as to act as our liaison officer in military matters with the SEATO, ANZUS, and ANZAM alliances. It is also understood that by defense department review of organization and methods in the three services, changes in procedure and the institution of common administrative services will take place on the domestic plane.

Germany and Russia

The World War II German organization had a separate combined planning staff known as OKW. It was divorced from the responsibility for the implementation of its plans. This cleavage has been held to be a fatal flaw in this early German attempt at unification. The OKW was founded in 1939 by a directive on unified preparation for war. It issued operational directives to the navy, army, and air force, whose supreme commanders then proceeded to execute them. The cleavage between planners and executors was indeed a serious one. Nevertheless, as we now know, political interference from the head of government, who, fortunately, took over complete and detailed control of operations, finally wrecked its prospects of success. We cannot derive from this the valid conclusion that the OKW inherently was inefficient for the function for which it was intended, but it certainly did not evolve into the key to victory.

There is very little published material on Russian defense coordination, but we are told that it is based on the monolithic structure of the Russian forces; "absolute internal homogeneity combined with external unity of action," one writer has phrased it. Extreme centralization always has characterized the Russian theory of government. Pressures and sanctions are applied to ensure unity in action by that system. In doctrine the Russians achieved great unity under Frunze's system which was embodied in their staff colleges, and equivalent unity in their organization was the achievement of Trotsky.

Fundamental Differences

They apparently have not been greatly concerned with the problems of diverging service interests because Russia, like Germany, was primarily a landpower. Whatever pleased the army has necessarily pleased the other two services—the navy and the air force being largely supplementary to the Russian Army. However, the existing system which is understood to be under one minister for defense, who has close control of autonomous services, apparently works efficiently. It is difficult to believe that with the growing strength and prestige of the Russian Air Force there are no cleavages within the Russian services. The air force must have a doctrine of independent operation and it is most probable that the air force doctrine will tend to differ from that of the hitherto paramount army. Such "deviations" could not be solved by merely liquidating the proponents. The Russians also must experience and solve these crises of organizational change.

The most obvious factor in unification is that of the difference between the serv-

ices themselves. This is deep seated and generally accepted. We even take pride in it, in building *esprit de corps* we train men to know that their own service is the best, and to give their best to that service. We cannot, therefore, destroy this virtue without losing a great asset. In doctrine differences are profound.

The United States Army promulgates that, ultimately, land forces must secure the decision. Therefore, all efforts of all services must be pressed toward that ultimate victory on land, and, as a corollary, the Infantry is the "Queen of Battle." The United States Air Force stresses a diametrically opposite view—that airpower is dominant, and that the intervention of the other services is not necessarily essential to victory for the United States, so that in some circumstances, without their help, the Air Force could win the war. Thus deep are these differences.

Single Service Conservatism

A cynic has expressed the differences in organization quite simply. The army is divisional in its organizations; the air force, a modern service, is organized functionally; and the navy is (Nelsonically) traditional.

Such differences are closely allied with service conservatism. It is possible for a service from purely conservative motives to reject valid progress. Originally, it was difficult to persuade the air force to accept the eight-gun fighter. Similar difficulties now persist with guided missiles.

Loyalty—Virtue or Vice?

Service loyalty is one of the finest of virtues, but it can be dangerous, particularly in technical fields. The disasters at Singapore in 1942 were presaged in earlier experiments affording conclusive results, in the *Centurion* trials in Britain, of the effects of dive bombing on battleships. In the United States, General Mitchell's trials had reached similar conclusions. Yet the new dominance of airpower at sea was understood only partially. It was decided to invest in coast artillery for the defense of Singapore instead of putting the same resources into the air component which would have made a great difference.

Human Limitations

A favorite argument against unification is that one man cannot comprehend the necessary range of knowledge to work it. Every man serving in an independent service looks to that service for his future prospects and promotion. Ability to work with other services is not valuable in itself, compared with his value to his own service. If we are to have true coordination of the three services, it is necessary to develop men with the background, the knowledge, and the experience to become the higher commanders of joint or unified forces, depending upon the system of reorganization. The loyal navy, army, or air force officer tends to distrust the military eclectics who have to serve as go-betweens. An important limiting factor is certainly that of human adaptability.

Specialization in the services reaches a very high degree. We regard engineers in the army, submariners in the navy, and the aircrews of the air force as being dedicated specialists. The problem is to create, from such specialists, the generalists who can become supreme commanders and staffs of supreme commanders in the future.

However, Blake became an admiral when he was 45 years of age and defeated the Dutch professionals. Kesselring, after a distinguished career in the German Army was transferred, in his late forties, to the air force because he was a brilliant administrator. He became an airman of some ability himself and successfully commanded air fleets and land forces. The father of the British Royal Air Force, Lord Trenchard, was over 40 when he became an airman, after a full career of soldiering.

It is not impossible to create the leaders or the staff officers for unified forces but we have to prepare them. The ability is not intuitive in every potential leader, and we must devise an educational system for their production. Without it they will not be produced.

Technology

Military technical factors continue to grow in complexity. Scientific development rapidly changes the nature of weapons, and speeds up the time factor in war. Weapons are developed during the course of war on which experience has not been available previously.

Weapons are becoming more complicated so that it is difficult for the layman to understand them, and beyond the capacity of the scientists to apply them.

Weapons are costly which intensifies the need for economy. If a guided missile costs millions to build, then we have to save money somewhere. If we can economize through unification then it will assist to provide more modern weapons.

When one weapon is common to two services, the services tend to wrangle as to who should own and operate it. In technical development a problem also arises when industrial resources have to be divided between the services, and opposing interests clash. An impartial body must then allot the resources.

Therefore, there must be a uniform and clear policy on the strength of forces and their nature before we can begin our industrial mobilization. This is a factor calling for unification.

Overlaps

In intelligence there has been such a broadening that Joint Intelligence Services or a unified service has become essential. We are now interested in the broadest forms of intelligence such as the basic war potential of our possible enemies, their atomic production, and their technical development. The balance of forces becomes an acute problem on several planes, producing arguments within the services on the strengths of the arms as opposed to their ancillary services—between "teeth" and "tail"; armored and infantry factions; fighters and bombers; destroyers and submarines. These differences call for a strong coordination.

Similarly, there are interservice functions which require coordination and would benefit from unification, but which are hard to define in terms of one particular fighting service. An example is airfield construction in a theater. Airfields are not necessarily for the benefit of the air force alone—they may be there for the primary needs of land forces, that is, airfields for close support and transport aircraft. These requirements are overlapping constantly; airpower itself is an overlapping service. We see this even in the use of strategic bomber aircraft on occasions to give tactical support to the army, quite apart from normal land-air warfare, and the similar use of carrierborne aircraft. The need for coordination there becomes great.

When the Bomber Command was first called in to assist the land forces at Caen there was disagreement between the airmen. The tactical air force did not succeed, and Bomber Command was recalled to plan the operation again. This time it was a success. There is a strong case for more unified control over all interlocking functions. Some of the issues to be resolved are the control of the missiles which are being developed at the present moment and the question of at what stage is it desirable that the army would cease to control missiles, that is, at what stage do missiles cease to be of tactical use.

It is interesting to note that Von Rundstedt complained of the difficulties of disunited command in the German Army, where, with the Luftwaffe antiaircraft, with its field divisions, parachute divisions, and parapolitical formations, it was impossible for him to exercise a truly unified command.

Finance

It is dangerous to advance financial economy or financial coordination as the principal reason for unification. Economy obviously is desirable but it would be wrong to allow mere finance to dominate what is essentially a problem of the functions of the three services.

The problems of sharing the budget persist particularly when there are cuts to be taken. Every year we see this battle of the budget. The United States controversy on the *B-36* was basically a financial one. If strong budgetary control is exercised, the priorities can be settled quite clearly. There should be one over-all responsibility and not the present divided responsibility.

Administration

The easiest and strongest case for unification lies in the field of administration. Field Marshal Montgomery has stated that separate, self-contained services lead to wasteful duplication. He has advocated integration of the administrative services now, and would start with the chaplains, the supply services, and the medical services. There are many homely examples of opportunities for integration of administrative services which can be left to the knowledge and experience of the reader.

In America, the single manager system has been applied to what they call subsistence (our supplies). In the British system we have the agency system. If a function has to be discharged in an area, then the service which has the major interest there can undertake it for the other services. This actually happens in war, but is not applied to peace. It seems axiomatic at first sight that a system which has to be worked in war should also be applied in peace.

Administration needs rationalization to ensure economy with efficiency.

There has been an increased burden on command and leadership in the type of war which has been evolving during the past two World Wars—total global war involving alliances and coalitions in which unified action is necessary. The present systems of coordination by mutual consent on so many planes tend toward confusion and waste of effort. In our times we require standing forces ready for instant employment; unified command is essential for those forces if they are to be directed immediately to their war tasks.

Command

The last war produced great integral commands—the systems of supreme command. The American system had a supreme commander served by separate commanders in chief of air, land, and sea forces. The British coordinated largely by committee. One unified system certainly is desirable. Moreover, we have to produce supreme commanders to lead us in war to whom we must give experience in peace. One of the last acts of Lord Mountbatten in the Southeast Asia Command was to call attention to this need to train supreme commanders in peace and that they should be trained on the job with experience of handling the forces, the men, and the materials which they will have to direct in war.

Political Advice

We are greatly concerned with ensuring sound military advice to our parliamentary leaders. Without unified command it is impossible to ensure balanced advice. One of the gravest sins of disunited services, as Field Marshal Montgomery has pointed out, is that of "empire building," and the wrong application of service loyalties, leading in turn to bad policies and bad plans. He says:

Get rid of the triumvirates of specialists, abolish the separate services, and put the senior officers on common senior lists. A rear admiral could command a division without any great difficulty.

In answer to this statement Sir Richard Gale replied that if he had an admiral as a divisional commander, he would put his hat on.

XUM

Typical Opinions

There is considerable variety of opinion on this subject among our erstwhile leaders. Lord Tedder is prepared to absorb all services, including the services of supply, into one large department. When we think of absorbing services into one large department we should put the problem in perspective. Certain British experts said it was impossible because the services are individually too big for one man to direct. Opponents of that view disagreed, because, in actual fact the United States Army, and even the United States Air Force, was as large as all the British services together. If they could be directed by one man, there was no reason why unified British services could not be directed by one man. This argument is, in fact, more valid for Australia.

Admiral Dickens has countered Lord Tedder by saying that integration is absolutely impossible except in minor aspects, and he was probably referring to administrative aspects.

Sir John Slessor, who has had a great deal of experience in planning war in alliance, claims that the British chiefs of staff had just as much power as their apparently more exalted American counterparts, and he believes that our present chiefs of staff system and its committee methods is the best we can have.

Sir Ian Jacob, with considerable experience of defense coordination, has advocated a merger at the top of the three services, a strengthening of the ministry of defense, with the adoption of one chief of staff and one promotion list for senior officers of all three services.

Admiral Hughes Hallett has written that he is prepared to merge the navy and the air force, because they have a similarity in function and, apart from that, he would merge certain administrative services such as intelligence, organizations, and plans.

Air Marshal Kingston McCloughry has written on this subject at some length, and has advocated a stronger defense ministry in the British system, but prefers separate systems of individual services coordinated by committee.

Sir Ralph Saundby, who was the Chief of Staff of Bomber Command under Air Marshal Harris, rejects the "inertia of vested interests" inherent in the present system.

History clearly demonstrates that failure in cooperation on the personal level in command can be fatal to operational success. Marlborough had to adopt devious means to keep his allies with him and to outwit their politicians and their commanders. There are classic examples of the clash of personalities in some of the greatest fiascos of the Russo-Japanese War which can be traced to the fact that the senior commander in the field actually had slapped the face of one of his leading generals some years before on a Moscow station. By merely hoping for the best we do not ensure that the best results emerge. We must organize to win.

Inevitability

The process of absolute amalgamation is a painful and difficult one. However, the old concept of joint service operation and procedures does appear to be gradually atrophying, and the prospects of amalgamation become clearer. The emphasis has changed, particularly because of the need for clear command machinery in war, and also because of the budgetary problems which have arisen in peace. Because of the complexity of modern war and also because of the overlaps which are already manifest in the existing system there is an inevitability in unification. The process must be gradual, particularly in view of the American history. We see there an initial concept of slow federation changing to a belief in rapid centralization followed by mere coordination; and, by the latest announcements, the evolution of a

more rigid and direct control of the three services.

The best common ground of defense organization before the nuclear age was in amphibious operations. Since the emergence of nuclear missiles and the imminence of nuclear warfare, the need for much swifter and more direct control has become obvious.

Initial Approaches

There are favorable approaches if we are to achieve unification with less difficulty and with a greater degree of acceptance by the public and by the services. If the parliamentary machine were streamlined, and we had one department of defense, it would ensure simplicity of control and direct responsibility. Furthermore, we should aim to unify the higher command and staffs first of all, and to rationalize and unify our administrative services. These services are eminently susceptible to unification.

The prerequisite of efficient unification lies in education at all levels, but particularly in education of the young officer. Young officers who have been educated together and inspired by a common doctrine will find future mergers between their services easier, particularly if they are educated in a broad tradition.

Selectivity

We need to unify the essentials and yet retain the benefits of the present traditions and systems. It is nonsense to scrap what is good, but organizationally we must keep abreast of the times. If we rationalize the political and higher command and the administrative aspects, the remaining stages of amalgamation will be realized in their own good time. It is not yet timely to evolve a new unified uniform of khaki hat, dark blue jacket, and lighter blue trousers, and then to tell the men that they are in one service. No doubt almost everybody would hate the idea. This amalgamation must necessarily be a gradual growth.

As Field Marshal Montgomery said, "In the next war we will all end up in the one service, or in two—the quick and the dead."

Soviet Military Art and Science

Digested by the MILITARY REVIEW from an article by Colonel S. Kozlov published in "V pomoshch' ofitseram, izuchaiushchim marksistsko-leninskuiu teoriiu (Sbornik statei) (An Aid to Officers Studying Marxist-Leninist Theory (A Collection of Essays)) Moscow, Voennoe Izdatel'stvo, 1959, pp. 200-220. Translation by Mr. Walter Darnell Jacobs.

IT IS generally known that any war is prepared first of all in the *political* respect. The preparation of a country for war politically has as its goal the securing of popular support along the road to and during a war, and the overcoming of hostile political influence.

In the Soviet Union the moral-political unity of the people is achieved by the execution of party policy, its organizational work, and its leading role and selfless devotion to the cause of communism and to the entire social and state system.

War also is prepared in the *diplomatic* respect. By means of active diplomatic activity, a state strives to consolidate its external political position, to guarantee the support of friendly countries, to neutralize wavering states, and to isolate hostile ones. The results of military actions are used in diplomatic activities in time of war.

War is prepared and waged in the *ideological* respect, for which all the variety of means and methods of ideological influence on the popular masses (the press,

XUM

radio, motion pictures, literature, and art) are directed toward the propaganda of one or another idea, mobilizing the masses for armed struggle for definite goals.

War is prepared and waged in the *economic* respect. This is the development of its economy for the achievement of preponderance over the economy of the opponent. Along with this is the application of economic measures which are directed toward the detriment and weakening of the economy of the enemy (embargo, prohibitory duties, and so on).

War can also be waged in the *psychological* respect. As historical experience has shown, aggressors always willingly resort to this form of struggle, attempting by various means—propaganda, for example, or means which operate directly on the psyche ("howling" bombs)—to crush the will to battle of the people of the opponent's country.

Under contemporary conditions war is prepared and waged in the *scientific-technical* respect. In the different areas of science and technology, new and more effective means of battle are sought to achieve scientific and technical preponderance over the opponent.

Finally, war is prepared and waged strictly in the *military* respect, that is, with armed forces which are trained and employed as the chief instrument of war. Their actions are subordinated to laws which have a specific character and are distinguished from the character of all other means, methods, and forms of struggle utilized in the interests of war and which assist in the attainment of victory over the enemy.

Military Science

Military science includes a general theory which considers all the broadest questions related to armed struggle, the laws of its conduct, and the means, conditions, and factors which influence its course and outcome. The general theory is a statement of the general bases of military science. In it is set forth the structure of military science, the interdependence and connection of all fields and disciplines which comprise it and their subordination. Consequently, *the most important component part of military science is the theory of military art.*

In military science *the theory of the training and education of troops* occupies a great part, for only on a scientific basis in this area can the necessary results be achieved.

Military Art

The study of military art includes the methods and forms of armed struggle utilized by the army, air forces, and navy in battles, campaigns, operations, and in war as a whole. It also is expressed in the practical activities of troops, the command and troop-leading demands from military cadres' high knowledges, definite skills, mastery, and a creative approach to the solution of tasks placed before them.

The theory of military art is a system of scientific views, principles, and rules, accepted in one army or another, on questions of the employment of armed forces in military operations of all scales. The concept of "military *art*" did not occur accidentally. It indicates that not all troop actions or common activities are attributable to art, but only those which are distinguished by originality, a high perfection, and which lead to significant results —to the defeat of the enemy.

In working out the methods and forms of military actions, Soviet military art proceeds from the fact that contemporary wars between large and powerful states have acquired the character of strenuous and protracted clashes. These clashes ordinarily have a world scale and are waged on land, sea, and in the air by a variety of combat means, taken in combination, in interaction, in mass, and in accelerating quantities. Victory against a strong, technically equipped, and skillful enemy can be achieved now only as a result of a

series of continuous and shattering blows in a complicated and diverse armed struggle, the main goal of which is the destruction of the vital strength and technology of the enemy, and the undermining of his military, economic, and moral potential.

The most important feature of our military art is its activity. This is explained by the laws of armed struggle wherein, according to the expression of V. I. Lenin, it is necessary to act resolutely, boldly, and offensively.

Applying every possible form and method of military activity and selecting that which is most appropriate to the concrete situation, Soviet military art considers the offensive as the basic form of armed struggle. It also acknowledges the defense but considers it a subordinate method of activity to which to turn when attack is unsuitable or is not remunerative.

At the same time, defense should be active, capable of slowing down hostile troops, and should inflict such heavy losses on them as would force them to give up the continuation of the attack. Thus the most important goal of the defense is the imposing on the enemy of the maximum losses, and depriving him of the initiative, the gaining of time, and the retention of space.

Among other possible methods of operation is the counterattack, utilized against an enemy who is still engaged in the attack but who has already been weakened by a stubborn defense. Nor are retreat operations excluded when necessary and when undertaken with the aim of the economy of forces and the improvement of the position of one's own troops.

It is necessary always to remember, however, that only an active, shattering offense is capable of guaranteeing the attainment of the most important goal—the complete destruction of the enemy.

Soviet military art is in an uninterrupted state of development. Under the influence of changing conditions and capabilities, the old methods and forms of waging war are transformed or disappear. New methods and forms appear which are the more effective, the more fully and exactly they reflect the objective conditions and requirements of contemporary war.

Military art usually attains its greatest development in the course of war against a strong and skillful opponent. This does not mean that the experiences of "small" wars are not of value for perfecting military art, but they must be evaluated properly and used boldly in contemporary conditions.

Dogmatism and triteness are foreign to Soviet military art—it is distinguished by flexibility, innovation, boldness and daring, and by the broad initiative of unit commanders and of all troop personnel.

In working out methods and forms of the preparation and waging of various combat operations, Soviet military art considers the uninterrupted development of weapons and technology. Contemporary means of struggle create an unusually dynamic, complex, and tense combat situation in which such factors as surprise and rapidity of movement may play an enormous and, at times, decisive role. The important influence of conditions of locality, weather, and time of year and day should not be forgotten.

Soviet military science studies the features of the various scales of armed struggle (strategic, operational, tactical) where quantitative changes can result in essential qualitative changes, and also considers the specific characteristics of the various types of armed forces. For example, battle on the sea or in the air has a series of its own special conditions; therefore, the existence of a naval and an air art as a part of the Soviet military art is entirely proper.

At the same time, Soviet military-theo-

XUM

retical thought denies the independent character of war on the sea and equally of war in the air, considering that combat actions, wherever and with whatever means they are waged, are subordinate to a single general goal of war. Because the achievement of this goal is unthinkable only on land, on sea, or in the air, the existence of the concept of "war on the sea" or "war in the air" is unjustified. There can be no talk about military operations on land or on the sea since the operations of each of these usually are closely interwoven.

The theory of military art sets forth its bases and general principles, valid for all types of armed forces, troop arms, and scales of employment in contemporary war. These bases and principles are established on known objective laws and assist in the application of the proper decision in one combat situation or another. In distinction from bourgeois military thought which considers the same principles nonhistorically and abstractly and considers them to be the result of the genius of outstanding troop leaders, Soviet military art considers that these principles flow from combat practice as its generalization, altering its contents in coordination with changing conditions of armed struggle.

Soviet military art is divided into strategy, the operational art, and tactics. All three of these component parts are connected among themselves and are mutually dependent. With a definite independence each of them investigates only the area of phenomena which have to do with its subject and supplements the other parts while furthering, in this manner, the solution of the general tasks which are placed before the armed forces. However, the leading role in military art belongs to strategy because particular successes in war are subordinate to general goals. The achievements of tactics are not important in themselves but only from the point of view of the attainments and possibilities of the operational art. Achievements of the operational art may exert an influence on the course and outcome of war only in case they are coordinated with the goals of strategy and coincide with its interests and opportunities.

Strategy

Strategy is that theory which comprises the leading part of Soviet military art and which expresses the basic method of waging war and its campaigns in coordination with its goals which are determined by the policy of the Soviet Union. For its subject, strategy has the study of concrete conditions and opportunities of waging war. It also develops methods for the utilization of armed forces for the achievement of victory on the scale of the war as a whole, and according to its separate stages of military actions and separate theaters.

The goals and tasks of strategy flow directly from the goals and tasks of state policy. With respect to strategy, policy plays a leading role and this situation remains unchanged from the beginning to the end of the war.

Only a full coordination of strategy with state policy, as well as a full coordination of political goals with the resources and means of strategy, make possible the successful waging of armed struggle. In the elaboration and establishment of the goals and tasks of the war as a whole and of its separate stages, policy is obliged to consider the resources of its own strategy and also the strategy of the opponent. Accordingly, strategy should never overestimate its own powers nor underestimate the powers of the opponent because both involve large errors in the conduct of war which are difficult to correct and which may lead to defeat.

Proceeding from the concrete goals, conditions, and resources of armed struggle, the theory of strategy helps properly to select the basic method of military ac-

tivities, to determine their forms and general limits, and to indicate the direction of the application of the main forces in coordination with military, economic, moral, and other resources.

The means of strategy are all the armed forces of the country in an inseparable unity and close combination, for war is waged not by any one type of them alone but by united forces. Therefore, the isolation of types of armed forces and the theory of their utilization is out of the question for Soviet military art.

For deciding the fate of war the actions of every type of armed force are important, not in themselves, but only in their interrelation. This is an objective law of strategy which finds its expression in the concordant development of each of the types of armed forces.

The coordination of the development of types of armed forces must not be understood as a proportional development which exists in unchanging correlations. It is apparent that, in accordance with the concrete goals and conditions of battle at the various stages of war, one or another type of armed force may play the leading role. Along with this, the resolution of separate individual strategic missions of war and its campaigns chiefly by some single type of armed force such as the navy or the air, for example, is not excluded.

It is also entirely in order that the success of a campaign or of the war as a whole may depend on the proper selection of the main blow. Along with this it is necessary to consider the entire aggregate of factors which shape the advisability of action precisely in the given direction. As the experience of history shows, among such factors are not only the purely military but also a series of factors of a political and economic nature —the attitude of the population, of the classes and parties of the countries and territories through which the chosen direction of the blow will pass, the presence or absence of definite economic resources, and others. The necessity of taking just this regularity into account is especially made clear and elaborate by Soviet military science.

Operational Art

The theory of the operational art has a short history. Operations as a basic form of armed struggle appear in detailed form in the change from industrial capitalism to imperialism and the proletarian revolution. Its theoretical comprehension has almost coincided with the appearance of Soviet military science. The creative method of Soviet military science and its revolutionary, innovating character have permitted it properly to evaluate that newness which was typical for modern wars, to explain it, and to use this newness in its theory.

The Soviet operational art investigates laws, inherent in modern operations, which are a complex of varied military actions on land, in the air, and on the sea by large groupings of troops. In their composition these groupings include units of various types of armed forces acting in definite operational or strategic directions.

According to their scale, operations are divided into army, front, or group of fronts actions. An operation which is conducted with a preponderance of forces of some type of armed force accordingly may be air, sea, antiair, air landing, and so forth. Operations in which large units of all the basic types of armed forces participate—for example, landing and antilanding operations—are called joint operations.

The goal of any operation is the defeat and destruction of large groupings of the opponent's troops or the seizure of an objective of operational importance. In a number of cases, operations—according to their goals, scope, and results—can directly influence the attainment of inter-

mediate strategic goals of war; that is, they may have strategic importance.

The practical application of the theory of the operational art consists of the organization of combat forces of troop units with the goal of deciding operational goals. This finds expression in the preparation for operations, including the determination of the goals, scheme, and forms, the decision as a whole, the planned utilization of forces and means according to place and time, and the comprehensive direction of the actions of formations and units. Political work among the troops and the population in the region of activity and the material-technical maintenance of units and formations have great significance in this connection.

The operational art of land forces investigates the methods and forms of the utilization of operational units of varying scales (army, front, group of fronts) in land theaters of military actions and also joint operations of units of types of armed forces conducted on coastlines.

The operational art of air forces elaborates the theory of the preparation and conduct of independent air operations and also the theory of action of aviation with land troops in naval, air-landing, antilanding, and antiair operations.

The operational art of naval forces elaborates the theory of the preparation and conduct of independent operations on the sea, the methods of the utilization of naval forces in joint operations, in sea landing, antilanding and antiair operations, and actions of land forces on coastlines.

The theory of the operational art has, in the capacity of an independent subdivision, the theory of the operational rear which elaborates questions of the material-technical maintenance of operations of various types and scales.

For the operational art there are laws which are valid as general laws, similar to the statements in the discussion of strategy. It also has its own specific laws which are engendered by the concrete, material conditions of the conduct of operations.

For example, it is characteristic for strategy to have a coordination of the various types of armed forces which operate either jointly in a single theater of military actions and in a single strategic direction or in various theaters. For the operational art the law is the combination of forces of operational units within the limits of a single operation and in the chosen operational direction.

Tactics

Tactics, which is concerned with the study of the objective laws of battle on land, in the air, and on the sea, and the working out of the methods and forms of conducting military actions on a tactical scale, is an inalienable component part of the military art.

The theory of tactics is closely dependent on the operational art which uses the means of tactics and tactical actions of troops for the solution of operational tasks. Directing, and to a significant degree determining, the development of tactics in its interests, the operational art does not exclude a relatively independent development of the latter. The guiding influence of the operational art on tactics is not expressed in the instruction of methods of battle but in the determination of those general goals and results which tactics should achieve with its own means in the interests of the operation. This inevitably will involve the selection of the forms of battle which are most suitable to the indicated goal.

Battle is an organized armed clash of detachments, units and formations of land troops, and air or naval forces, acting independently or mutually one with the other, pursuing the goal of the destruction and capture of the enemy or imposing on him such losses as would force him to turn from the fulfillment of his mis-

sion. Battle is conducted by armed people, basically organized and trained, directly utilized for the imposition of damage on the enemy by a variety of military techniques. It is limited in time and in space by a definite quantity of forces and means, the utilization of which engenders specific laws. Therefore, it is possible to distinguish between the tactics of detachments, units, and formations.

Within the limits of contemporary operations or independently, battle can be conducted:

On land (ground battle)—by land troops alone or with the support of the air forces and the navy.

In the air (aerial battle)—by air forces or with the support from the ground (sea), including the resources of antiaircraft defense.

On the sea (naval battle)—by naval forces or with the support from the land and air.

Tactics are divided accordingly into general tactics which examine the laws of contemporary general troop battles, and tactics of types of armed forces (land troops, aviation, navy).

Each of the tactics of a type of armed forces which has its own general tactics is also divided further into tactics of type of troops. In its turn, the latter is divided into tactics of the detachment, of the unit, and of the formation.

Combat actions of troops should always be secured in the material and technical respect which predetermines the necessity for the existence of a detailed system of the army rear. In accordance with this, contemporary tactics have a division of tactics of the troops of the rear and the latter in its turn is divided into tactics of the organization and establishment of the rear in the various types of battle, tactics of supply, military-medical tactics, and so on.

The successful combat actions of troops are unthinkable without reliable political work which calls for the creation, support, and strengthening of the necessary moral development of the troops, the raising of the steadfastness and persistence, the intensification of the onslaught in battle, the mobilization for overcoming difficulties, and the achievement of decisive results.

A real criterion of the level and quality of military art, of its appropriateness to its purpose, is that result which is achieved by the practical application of the theory of the military art in a war against a strong and trained opponent. For us, the past war against Hitlerite fascism was such a severe test. Our military art passed this test with honor, demonstrating its high level, progressive character, and indisputable superiority over the military art of the opponent.

In coordination with the development of tactics of battles involving troops and means of battle, new tactical methods appeared for artillery, rifle troops, air landing, engineer, communications troops, and others. The operational art also enriched the tactics of aviation. The methods of operation of the navy were perfected.

Soviet military art emerged from the Second World War significantly enriched. The experience of this war, unprecedented in its scale, the variety of conditions in which it took place, of methods and forms by which it was conducted, has a great value. However, military affairs move forward quickly and require us always to be equal to contemporary demands.

The Basic Aim

The basic aim of contemporary military art is the skillful application of the means of mass destruction with the help of aviation, rocket weapons, and artillery, and the rapid realization of the results achieved thereby. In connection with this, the role of the air forces and of tank and air-landing troops has grown and the role of the navy changed. Military actions have acquired a swift, dynamic character.

The importance of surprise, of the initiative, and of the independence of all personnel has been sharply raised. Troops, utilizing their mobility which has been acquired by motorization and mechanization, should maneuver boldly and quickly, concentrating for the assault in the very process of its execution, perform powerful, shattering blows, and disperse rapidly in the interests of guaranteeing the conditions of the maneuver and of preserving forces and means from the blows of the enemy.

The necessity of attacking in the highest tempos, of forestalling the enemy in concentration, of seizing boundary lines, and of preventing the organized withdrawal of his forces and means all make necessary the waging of military actions uninterruptedly night and day. This is made possible by the development of the corresponding auxiliary techniques. A stubborn defense must not be capable of being destroyed by the blows of a strong opponent who employs means of mass destruction, aviation, rocket weapons, large groupings of tank troops, and air landings. The skillful utilization of powerful means of destruction, of fire and maneuver, the use of the locality, and camouflage and security measures permit the defenders to solve this problem in short periods and with decisive results such as could not previously have been achieved by the defense.

The successful and uninterrupted development of Soviet military art also depends on the status of many auxiliary military aspects. These include military history, military administration, military geography, and a series of others.

At the basis of the education and training of Soviet troops lies concern about the raising of the political consciousness of personnel, its combat mastery, and the relating of methods of training to the character and demands of modern war. These demands impose a high responsibility on soldiers with respect to moral steadfastness, physical endurance, technical literacy, and comprehensive military culture. There must be a consideration of difficulties which now arise with the creation in the educational order of conditions more closely connected to military reality. In this connection, officers are urged to seek more inventively for possibilities of creating such conditions in the educational process as would permit the development in every way possible and in all personnel of steadfastness, mobility, endurance, gumption, decisiveness, and boldness.

The inculcation of any patterned methods in those in training is completely inadmissible. The most severe enemies of the military art are triteness and passivism, a lack of creativity, of flexibility, and of the capability of acting in accordance with the situation in order to force and to direct the course of events.

Originality in the combat training of troops consists of the trainees receiving skills in the basic military art and practice in the utilization of methods and forms of battle worked out by it. Along with this it is necessary to keep in mind the fact that military art does not provide ready, unchanging recipes for all cases. The forms and the methods of action recommended by it are good so far as they are appropriate to the real situation. Art is necessary in the education and training of troops as it is in any other complicated matter.

Concerning Strategic Depth

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel Amund Bjercke in "Norsk Militaert Tidsskrift" (Norway) Issue Nr. 9, 1958. Translation by Mr. LaVergne Dale, Leavenworth, Kansas.

STRATEGIC depth, generally, is the geographical space needed for carrying out a defensive or an offensive war.

This space must be sufficient to permit relatively undisturbed maneuvering or withdrawing of military forces. In addition, it must be of a size that will secure the necessary productional basis and a relatively normal functioning of the nation.

It is of decisive importance to a belligerent power to have sufficient strategic depth to prevent its military forces from being compressed into a restricted area, thereby losing space for maneuver. The ratio between the respective strategic depths of two adversaries repeatedly has had a decisive influence on the outcome of a war, and strategic depth has shown an increasing trend toward greater significance with the development of modern nations.

In addition to activities of a purely military nature or those related to the economics of war, today we must remember that there also exist other activities of sociological importance which require space for functioning in a war situation. These include the establishment and maintenance of favorable foreign political relations and free domestic political life (the political sphere); an active foreign trade and, from the standpoint of national economy, the flexible employment of labor forces and productional means (the commercial sphere); and participation in the general international exchange of ideas with a free shaping of opinions and exchange of views in an intellectual milieu without imposed conformity (the ideological sphere).

The respective military and sociological requirements for strategic space have an obviously different dominance in the two forms of conflict we are now accustomed to consider: that is, cold and hot war. In the first form, preponderance is in the sociologically and politically characterized sector, and, in the second, military requirements will have precedence.

Narrowing Strategic Space

In recent years the military requirement for strategic space, as viewed geographically, has changed with the combat means available. A few factors from the two World Wars will demonstrate the stages of this development.

For the Central Powers, World War I was a two-front war on land. Germany and Austria were cut off from the rest of the world by the naval blockade of the entente (England, France, Russia, and Italy). The U-boat war of the Central Powers was able to work against the entente's sea communication lines, but was not able to interfere in such a manner with the Allies' strategic space as to be able to lay waste to or trouble the latter's production basis. The U-boat war achieved temporary results until the entente devised the proper countermeasures, but accomplished nothing of decisive significance. In contrast to this, in the end, the Allied naval blockade acquired decisive significance with the reducing effects it had on the Central Powers' sociological and productional activities. The population was reduced to the verge of starvation, and production was halted because access to the world's raw materials was cut off.

In land warfare the principal tactical and strategic movements of military units took place on foot with railroads and sea transportation as auxiliary means. With

the exception of the Paris cabs for the transportation of Marshal Petain's corps to the Battle of the Marne in 1914, it was not until the latter part of the war that motorization acquired any significance in tactical maneuvering.

Generally, we can say that after the war had settled down into a trench war —with the Axis Powers cut off from the rest of the world—none of the belligerents had combat means capable of achieving decisive results in the interior of his adversary's strategic space. The war in the air, which got underway with increasing force in the latter part of the conflict, was chiefly of local significance in the vicinity of the fronts. The bombing of London from the zeppelins was merely an episode that produced neither great results nor lasting effects.

Neither of the parties was able to achieve a breakthrough on the land front to permit an attack on the opponent's sociological and production centers before exhaustion forced the Central Powers to abandon the fight. The limited range of war materiel forced the parties to a war of attrition in entrenched fronts and a blockade war without the possibility of a decisive blow against the opponent's production basis in his strategic space.

World War II

In the European theater, World War II presented about the same over-all picture as World War I. The Axis Powers (Germany and Italy) again fought a two-front war on land and in the air, cut off from the rest of the world by a naval blockade they were not able to break. Their U-boat war again had only a temporary guerrilla effect on the Allies' sea transportation—until countermeasures were found for combating it. The Axis Powers' air arm was not able to carry out a strategic war against the Allies' production basis.

In the land war motorization dominated both the tactical and the strategic movements of military units, with the armored arm as the decisive factor. The air arm was growing steadily in importance, both in the movement of powerful units by air and in the strategic bombing of the Axis Powers' production basis—an employment which acquired decisive significance. The conclusion of World War II was marked by Germany's rocket war against targets in England and on the Continent, and the atom bombing, by the United States, of Hiroshima and Nagasaki.

Although the Axis Powers controlled all of Europe west of the line Leningrad-Stalingrad (except for Sweden, the British Isles, the Iberian Peninsula, and Switzerland), this geographical space did not provide sufficient strategic depth against the Allied air arm. The development of motorization and aviation resulted in a great expansion of the tactical field of battle as compared with World War I. The rocket weapon had not gone so far in its development as to require any changes in the tactical and strategic war picture.

If we think of a world war III, it is logical to imagine that it will be characterized by greatly increased activity in aerial warfare as regards the movement of troops and materiel by air, and by tactical and strategic rocket warfare with nuclear fission weapons, which will alter the tactical and strategic war picture to a considerable degree.

The development of intercontinental rockets with over 8,000-kilometer range and of nuclear fission explosives, makes it possible to reach into the strategic space of even the world's greatest powers with crushing effect.

The age of space travel, on the threshold of which we now actually stand, indicates possibilities of unprecedented surveillance and domination of the earth's surface, the consequences of which are not fully understood yet.

New Artillery

In the defense forces of a few countries the rocket arm is now included as an organic arm of the individual branches of defense. This family of weapons is usually subdivided into:

Short-range rockets with range up to approximately 30 kilometers and weights corresponding to light field artillery, and others with ranges up to about 350 kilometers and with the weight of medium heavy field artillery. These types of rockets will, presumably, be included as an artillery arm in army forces as division and army (corps) artillery respectively.

Intermediate range rockets with ranges up to approximately 2,500 kilometers and with weights corresponding to heavy artillery. These types of rockets likely will be employed both tactically, as the former heavy artillery of independent army groups, and for strategic missions within their range.

In addition to the foregoing types of rockets, there are special types for use by navy, coast artillery, aviation, and antiaircraft defense besides the intercontinental rocket with ranges of over 8,000 kilometers.

Both short- and medium-range rockets can be provided with ordinary explosive charges or with nuclear charges.

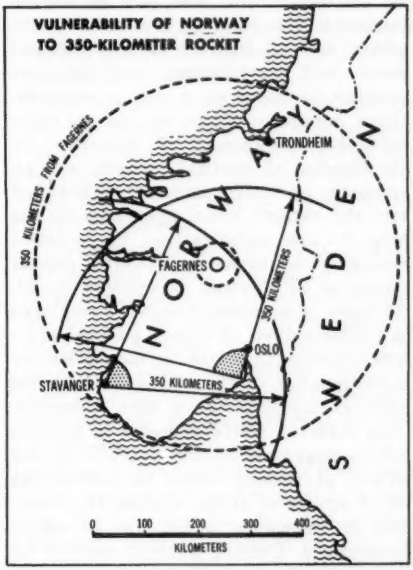
The transportation of this rocket artillery does not appear to present any greater problems than does ordinary field artillery. Transporting rockets by air appears to be a simpler matter than the transportation of cannon of the corresponding weight class.

Capabilities for fire maneuver are relatively limited in comparison with those of normal artillery from the standpoints of projectile quantities and the probability of a hit, but far surpass the latter with respect to range and explosive effect.

The maneuverability of the other arms of the service often was limited in mobile combat with fire and movement by the classical artillery's capacity for maneuver. The rocket artillery, which in itself is a new artillery family, will probably change this relationship. In order to exploit this artillery's capacity for maneuver, the other arms will be obliged to effect an increase in their mobility which only air transportation can satisfy.

To illustrate this relationship we may superimpose these ranges of fire on a familiar geographical picture (Norway), as shown on the map.

The consequences of rocket artillery appear, therefore, to point in the direction



of a great increase of the range attainable by combat elements with the corresponding expansion of the tactical battlefield far beyond the bounds set by conventional combat means.

As is shown on the map, it is obvious that Norway does not possess sufficient geographic area to ensure military stra-

tegic depth for defensive warfare adequately. Even viewed tactically neither the length nor breadth of Norwegian geographic space is of sufficient magnitude to ensure against surprise attacks or against actions which usually take place in a theater of war.

A Nation's Strategic Depth

In considering a nation's strategic depth it is necessary to take into account the forms of aggression a nation can be exposed to in addition to hot war—namely, cold war, occupation, and annexation.

In a cold war the attacker will attempt to bring about a political revolution in an existing nation that will be advantageous to him. In order to achieve this he makes use of legal or illegal political means and organizations, and extensive propaganda based on a strong organizational apparatus. There is also an indiscriminate employment of dialectics for the shaping of political thought, and an economic and organizational infiltration into the nation's social apparatus by the help of cover organizations. These active means are supported by powerful combat means as an effectual background threat. At times, also, armed forces are employed in limited actions of a more political character in order to create the foundation for a continuation of the cold war where the political measures have been thwarted. This form of warfare makes it possible for an aggressor to obtain a hold on the affairs of nations which lie outside his direct sphere of action without the necessity of unleashing a hot war of major proportions. Defense against warfare of this kind must be based, likewise, on political and sociological measures with armed forces as the positive means of support.

Occupation and annexation are similar in that enemy armed forces have moved into the land area in question. The feature which differentiates them is that occupation is of a temporary character and occurs during the course of a war that is still in progress, while annexation is the permanent assimilation of a nation by an aggressor after a victorious war.

The aggressor usually has need of the services the nation in question is able to contribute. This may well have been the principal reason for the launching of the aggression. Occupation or annexation does not mean, therefore, that the aggressor can now give himself over to the indiscriminate and wholesale deportation of the country's population, replacing it with his own. This would bring to ruin the modern nation's complex structure and, at the same time, render impossible the contribution of all the services the occupier needs to receive.

An aggressor's aim must be to obtain for himself a growing control over the conquered nation by placing key men in the national apparatus, the unification of political and voluntary organizations, control of press and opinion, liquidation of resistance movements, partial translocation of population elements, the suppression of troublemaking groups, and the securing of political and administrative control by the use of political and armed force. This is a lengthy task and it will always be dependent on the effectiveness and strength of the political and military power on which it is based. On the other hand, the actual results of the policy the aggressor has imposed on the country count for a great deal in the internal equilibrium of the nation.

The control which must be exercised over the subjugated nation requires the establishment of a control apparatus by the occupier which, in itself, is an administrative hierarchy with extensive ramifications. This usually comprises forms of double administration and a strong increase in the bureaucratic system.

A subjugated nation usually can count on support and assistance from without by friendly organizations and powers. This

support may operate as an infiltration which strengthens the national undercurrents in the population and releases a reaction against its subjugation.

These factors, in time, create the opportunity for counteraction. There exists here the possibility of a resistance movement that may continue even after the armed conflict has ended. In a way this is a reversed cold war.

It is these possibilities for a resistance movement that constitute the strategic depth within a modern nation's interior. As geographical depth continues to shrink as a result of the increase in range of modern weapons it is likely that the strategic depth of nations will gain in significance.

Schooling in Resistance Movement

The prerequisite for exploitation of a nation's strategic depth is that its population be prepared for, and schooled in, the resistance movement warfare which should result from the reaction against subjugation.

The cold war after World War II revealed how little capacity for resistance the Western Nations had against the means employed in this form of warfare. The recognition of this fact gradually has given rise to an effort to discover the correct defensive and countermeasures. The indications are, however, that the initiative still belongs, to an overwhelming degree, with the Communist States.

During the 1940-43 occupation of Norway the resistance movement gradually was able to evolve into effective action in spite of the fact that the Norwegian people had been poorly prepared for the situation they encountered. Because of the lack of preparation they were forced to pay a high price for the knowledge of resistance methods finally obtained.

Fortunately, the Allies won the war, but if Germany had won, it is questionable whether the resistance movement in Norway could have continued along the same lines, with the same means, organizations, and leaders, as before 1945. In any case, the people neither knew how a continuous resistance movement should be conducted during occupation, nor were they prepared for it.

Those who learned the hard-won lessons of 1940-43 will, in the not too distant future, have disappeared. Also, it should be recognized that an occupation after a future war may be based on a different state of affairs than that of the German occupation of World War II. It should, therefore, be taken for granted that the experiences of 1940-45 will be inadequate to assure that the organization of a resistance movement can take place in a smooth manner if Norway is again subjected to occupation by a foreign power.

Both these circumstances, and the desire to strengthen the nation's capacity for resistance in cold war, give rise to a need for systematic schooling in resistance movement principles within all the nation's segments.

Schooling such as this can be given to our soldiers during the period of their service and to our military commanders at the time of their academic training. There are, however, two circumstances we must take into consideration which impose a strong limitation both in the effectiveness and the adequateness of such procedures.

First, only a portion of the male population undergoes a period of military service. We can assume that the military schooling will be characterized by the problems of guerrilla warfare and adaptation to the military organization's needs within the resistance movement. A like requirement will exist in the case of all other national organizations, but on the basis of differing premises and characterized by the particular organization's sphere of activity and apparatus. The military defense, which constitutes but a

XUM

minor part of the over-all national entity, will, therefore, hardly cover the schooling requirements that will appear when an entire nation is to prepare itself for a resistance movement.

Second, it is probable that all the military organization apparatus including the Home Guard will be instantly neutralized in prison and labor camps when the hot part of the war is ended. Only "reliable" elements will get out after they have gone through a comprehensive reschooling.

Resistance activity is a matter of great importance to individuals who must live inside barbed wire enclosures for some length of time, the results of their activity, however, will be very small and can hardly be thought of as influencing the remaining national resistance to any great extent. We run the risk, therefore, that the preschooling in resistance movement that has taken place within the military forces will be largely lost to the nation when general resistance activity is in order during an occupation. With schooling limited to the military segment, the remainder of the national population will find itself in the position of not being prepared, as was the case before, when it comes to carrying on a resistance movement war.

These facts indicate that it is hardly enough to conduct schooling in resistance movement for military conscripts.

Again, turning to cold war, recent years have shown the need for the Western Nations to master a rational system of instructional activity and propaganda paired with schooling in organizational and political technique in order to be able to resist cold war. This need is greater than could have been imagined under more normal conditions. It goes without saying that the schooling must be organized, and means of action fitted into an effective organizational apparatus which can operate as a defense of the free nations and permit their normal development under the conditions of cold war.

There is, moreover, a noteworthy connection between cold war and occupation, in that both forms of aggression lay principal stress on political and sociological means of action, with armed forces as a basis of power and background threat. This gives us a reason for concluding that, in many ways, there is to be found a similarity between resistance movement against cold war and resistance movement against occupation.

Conclusions

It seems, therefore, logical to conclude that:

1. The work that is accomplished for strengthening the free nations against the effects of cold war should be carried over into the schooling in resistance movement which will be required during an occupation.

2. Exchange of experiences between these two sectors of effort will, with coordination, lead to a rational method of operation.

3. There is need for an organized homefront both during a cold war and during an occupation.

MOVING?

If you are moving, please notify the MILITARY REVIEW, Fort Leavenworth, Kansas, of your change of address. Be sure to include your name, *old* address, and *new* address.

The Atomic Army

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel B. N. Majumdar in "The Infantry Journal" (India) October 1958.

IT CANNOT be doubted that the next war will be an atomic war—it would be suicidal to think anything else. From the viewpoint of India, the prevailing attitude is that since she has no such weapons and it will be a long time before any eastern power will ever have them, there is no necessity for any action to think of an atomic army. But this is nothing but shortsightedness.

Like all other science, the science of warfare is progressive. Any nation that does not display a progressive attitude not only may lose its leadership but may even face ruin. Therefore, it is all the more necessary that we in India show interest in the development of the latest weapons and techniques of warfare, and train our armed forces in all their implications. Then, when atomic weapons are procured or developed at a later date, it will be very simple to adopt tactics and strategy tailored to their requirements, as the troops already will be trained in the art of atomic warfare.

The study of its various effects even in an academic manner is necessary and worthwhile for all those whose profession is soldiering.

Training

There is no doubt that man is the basic factor in any war and must be trained to survive as well as fight a nuclear war. If the soldier is not fit for such type of warfare, then no amount of equipment will enable him to survive, let alone win a war.

To some extent, every nation is devoting its thought to atomic warfare whether it possesses such a weapon or not. The main reason is that training holds good both for atomic and conventional warfare. If a soldier is trained for the hardest kind of warfare he comes out well in all other types.

The training of soldiers for atomic warfare must be of the highest order. The basic principles of training—for example, physical fitness, speed, and initiative—are still the same, but the types of situations that a man might have to face may vary from the conventional type of warfare. A soldier must have physical fitness of the highest order and individual initiative to fight with little or no direction from superior officers. He must be master of all trades (drive all vehicles, fire all weapons, and use all types of communication sets); able to conceal and camouflage himself against detection either from the ground or air; dig fast for protection against heat, blast, and radiation; and work under darkness. These are a few essentials but there may be more frills.

Basically, training for atomic warfare must be conducted so that a soldier is prepared for the worst. Initially, the war might have been started with conventional weapons and changed later to atomic weapons, but a soldier, when trained for the worst, always will come out well in such a situation. In other words, a soldier must be trained for all eventualities as there will be no time to switch to atomic warfare from the conventional in the middle of the fight. *This point should always be borne in mind by all those who are responsible for enunciating training policies for troops.*

We all have introductory knowledge of the various effects of an atom bomb, and it will not be difficult to give at least elementary training to troops in this type of warfare. It can neither be abolished nor avoided, and hence we must be alive to the realities of *atomic warfare* and prepare to meet such a contingency.

XUM

Organization

It is foolhardy to fight an atomic war with conventionally organized formations. This fact, plus the constant danger of a conventional war occurring in various parts of the world, presents a very difficult problem to the policymaker.

It must, however, be borne in mind that military strategy must be formulated on the assumption that the next war will be an all-out atomic war from the very beginning. Therefore, if the regular army is not trained as such then it will meet with disaster. Similarly, the tactical concept and organization must conform to the requirements of atomic warfare. *An atomic war cannot be fought by a conventionally organized army, but a conventional war can be fought by an army organized for atomic war.* Hence the primary need is for an atomic army capable of using both conventional and atomic weapons, depending on the situation.

Keeping in view the main features of an atomic war—dispersion, ultraspeed, and high-quality leadership—we must have an organization that is small but does not dissipate strength when required to drive a wedge at a given point. To achieve dispersion, without losing control in dispersed conditions, it is essential to have formations of small numbers—not exceeding 6,500 in any one group—with echelons of headquarters and services fully eliminated to achieve more speed. To elaborate, the brigade group should be the largest formation of all arms and services. These may have as many as five or six infantry battalions to enable grouping of various combinations to meet any situation that may arise in atomic or conventional warfare. The division is a large and cumbersome formation for an atomic war.

The next higher headquarters should be a corps capable of handling six or eight brigades without having to deal with their headquarters when operations are in progress. The corps commander should deal directly with the battalions or supporting arms when the battle is actually in progress as, otherwise, the information moves slowly and thereby the operation is delayed. In atomic warfare, speed is the vital factor; it may decide victory or defeat.

The old concept that a commander will be able to command and control up to three or four units/formations seems to be completely out of service now. During the last war many commanders had much more to handle than the stipulated number.

To achieve speed, the formations must be air-transportable. Therefore, they must be lightly equipped, but no reduction in the weight of firepower should be accepted. It is the firepower that will reduce the requirement for manpower.

The speed which dispersion and concentration of forces can achieve can be increased through use of radio communications. Ground wire lines should be eliminated as far as possible, as these can be bombed out of existence easily. It follows then that radio communication must be reliable under all conditions. There should not be piecemeal distribution of force. Communications is a vital necessity for controlled dispersion in an atomic war. This also will give the commander the added advantage of being able to mass his troops at the right time and place before being found out by the enemy, thus enabling him to achieve a decisive result.

To sum up, the organization should have the following essentials; rapid cross-country mobility, firepower and shock action, speed, and a rapid communication system. Added to all these is the problem of leadership of an atomic army. Slow and old diehards have no place in this army where the only requirement will be the possession of "atomic leadership." The commander who possesses a fertile and receptive brain for atomic warfare is the only person suitable for such an assignment in an atomic army.

XUN

Conclusion

It is considered that those nations which have not yet received or developed atomic weapons should at least train under simulated conditions based on the various data and information published so far by those who are already in this field.

It must not be ignored that nuclear wars will be fought in the future. The roles and missions of the armed forces should be reviewed in the light of latest developments of atomic weapons and techniques of warfare.

Suitable organizations should be formulated and tried out from now on as no trials or experiments are possible during war. Above all, training and leadership of the highest order must be the aim. We must remember that if we perspire more in peace we bleed less in war. It cannot be denied that "we should think peace, talk peace, and act peace," but "if war comes, we should be prepared to fight it, to win it, and to survive it." To win an atomic war we must organize, train, and think of it now!

Warfare has passed from the age of the tooth and claw, through the club, stone, spear, bow and arrow, rocket, gun, rocket again and now the guided missile age. We are putting brains in our weapons; thank goodnes they can't think. But who knows, maybe that's the next step.

Each new weapon in turn has been absolute, starting with the club. The atomic bomb was absolute in 1945; the thermonuclear bomb was absolute in 1956; the thermonuclear guided rocket is now the 'ultimate' weapon; but in the future what?

Do not be deceived that some 'ultimate' weapon may solve all our problems of the defense of freedom. We need all the deterrent weapons we can get to prevent an enemy of freedom from launching a destructive war to further his plans for world domination and the death of freedom as we know it today. As long as the enemy knows his use of mass destruction weapons will result in massive retaliation from a variety of sources—from long-range bomber, shore based and sea based; intercontinental ballistic weapons; intermediate range ballistic weapons, shore based and sea based, and from air breathing tactical and strategic mass destruction weapons launched from land and sea—then he will hesitate before launching into such a war.

Rear Admiral K. S. Masterson

XUM

BOOKS OF INTEREST TO THE MILITARY READER

RADIOACTIVITY MEASURING INSTRUMENTS. A Guide to Their Construction and Use. By M. C. Nokes. 74 Pages. The Philosophical Library, New York. $4.75.

BY LT COL GEORGE D. CARNAHAN, *OrdC*

Within the 74 pages of this book are included detailed instructions for making a number of the simpler radioactivity measuring instruments. The requirements for success are elementary knowledge of electricity and an ordinary measure of manual dexterity.

There is no doubt that there is great public interest in radioactivity and its measurement today, but few people are aware that these measurements can be made in any laboratory. The components required are now easily obtainable. Very little power is necessary, so that many of the instruments can be made fully portable. The degree of accuracy obtainable with them is quite sufficient for an introduction to the study of radioactivity, a subject which cannot be ignored and which so readily excites the interest of students.

Geiger-Muller tubes and counters are discussed in detail and many applications are covered in later circuits. The last chapter contains a series of "practical hints," or translated literally, a good discussion of troubleshooting the equipment.

If the costs of the various components used had been given in terms of dollars and cents, in place of pounds, shillings, and pence, the book would be more useful to the United States reader.

SPACE WEAPONS. A Handbook of Military Astronautics. Compiled and edited by the Editors of *Air Force* Magazine. 245 Pages. Frederick A. Praeger, Inc., New York. $5.00.

BY MAJ KEITH C. NUSBAUM, *Arty*

Taking as their theme the fact that many of the great explorations of history have been made by military men, the editors of *Air Force* have concluded that the exploration of space will be begun and furthered by military technology and enterprise. Having done so, they present a series of informative articles by experts, each of whom is connected in some major way with the USAF or its missiles program.

These articles outline for the reader a short history of the intercontinental ballistic missile programs, explain the aims of these programs, and present a summary of the major goals of the United States missile and space research for the future.

Of particular interest is a statement by James H. Doolittle, who remarks:

Before the end of the century . . . a man or men will be landed on Mars or Venus and brought back. If I weren't a conservative, I would say that before the end of this century two more events will take place: a permanent observation station on the moon, and interplanetary travel as a common thing.

An explanation of the facts on which this statement is based can be found, interestingly presented, in *Space Weapons.*

THE TANKS. The History of the Royal Tank Regiment and Its Predecessors Heavy Branch Machine-Gun Corps, Tank Corps, & Royal Tank Corps 1914-1945. By Captain B. H. Liddell Hart with a foreword by Field Marshal Viscount Montgomery of Alamein. Volume One 1914-1939, 462 Pages. Volume Two 1939-1945, 555 Pages. Frederick A. Praeger, Inc., New York. $15.00 set.

BY MAJ HOWARD H. BRAUNSTEIN, *Armor*

This official history of the Royal Tank Regiment from the pen of the acknowledged military historian and analyst—Captain B. H. Liddell Hart—is an authoritative account of events from the inception of the tank to the present day.

The tactical idea which inspired the creation of armored forces—that of fighting mounted to gain mobility and maintain momentum—as the cavalry when this arm was the decisive instrument of battle, is related by the author covering a span of over 30 years embracing two great wars.

Offering the question, "Has the subject of 'The Tanks' become purely a matter of history with the advent of the nuclear age?" the author at the conclusion of this two-volume history of British armor provides the following discussion:

While nuclear weapons have diminished the likelihood of a major war because of the probability of mutual suicide, they may have consequently increased the possibility of limited war.

The employment and organization of armored units and formations must change under the threat of nuclear warfare. Dispersion has become the order of the day but unless concentration is achieved before battle, piecemeal losses will render the armored stroke ineffectual. In this concept, where all tactics revolve around the use of nuclear weapons, the tank usually will be a dominant factor. Its ability to concentrate quickly, its firepower and speed into action, and its mobility and self-protection are the characteristics which make tanks the ideal supporting arm for the nuclear weapon.

Although a history of British armor, these volumes are of great value to the mobile minded professional of all arms in the evaluation of armor on the nuclear battlefield.

THE ARMY ALMANAC. Edited by Gordon R. Young. 797 Pages. The Stackpole Co., Harrisburg, Pa. $8.95.

This is a completely revised edition of the 1950 publication. The scope has been expanded by the addition of a great deal of new material. *The Army Almanac* presents a wealth of factual information pertinent to Army affairs. Included are such items as organization, weapons, training, Reserve and National Guard, communications, civil affairs, and others too numerous to outline.

The major and minor wars of the United States are covered in a fine condensed military history. An excellent indexing system will allow the busy reader to find any desired information quickly. For a complete and ready reference the book is outstanding.

WHY MEN CONFESS. From the Inquisition to Brainstorming. By O. John Rogge. 298 Pages. Thomas Nelson & Sons, New York. $5.00.

BY DR. IVAN J. BIRRER, *Ph. D.*

The author, a prominent attorney, relates the story of confessions from the time of the Inquisition to the time of Mao Tse-tung with special attention to the Moscow Trials. His thesis is that man has inherent qualities making him predisposed to confess, truthfully or falsely. He points out how conditions in Russia strengthen the confession predisposition. The volume is interesting reading, representing a merger of legal thought, psychological theory, and historical research.

XUM

NUCLEAR TACTICS, Weapons, and Firepower in the Pentomic Division, Battle Group, and Company. By Colonel Theodore C. Mataxis and Lieutenant Colonel Seymour L. Goldberg. 254 Pages. The Military Service Publishing Co., Harrisburg, Pa. $4.25 clothbound, $3.50 paperbound.

BY LT COL CHRISTOPHER R. KEEGAN, *Inf*

Here is a book that belongs in the library of every military unit, and on the desk or work space of every officer, noncommissioned officer, and enlisted man. It contains the basic knowledge required by all tactical commanders, from the squad to the division, on nuclear tactical doctrine and concepts, weapons, and firepower in the pentomic divisions.

The book is a compilation and simplification of a vast amount of material scattered throughout numerous field manuals, circulars, and service publications. It is a compact, readable, and useful document that should be interesting and vital reading to all ranks.

Although the tactics in this book are in some cases new and in the realm of "crystal ball gazing," they provide a point of departure that should energize the imaginative individual.

In addition, it includes techniques for the employment of nuclear weapons, methods for determining troop safety, protection required against a nuclear attack, nuclear delivery systems, and the pentomic division organizations, to include the Marine Division. It covers a brief look at the tremendous strides the Soviets have made in their new reequipped land army, with photographic coverage of the Soviet family of weapons.

The authors have dedicated this book to the "experts of the Army." It should give some idea of the new tactics and techniques being evolved for the nuclear battlefield, and is recommended for all who will have "a hand and a mind" in the development of new doctrine and concepts.

AGGRESSION. By John Paul Scott. 149 Pages. The University of Chicago Press, Chicago, Ill. $3.75.

BY LT COL L. GORDON HILL, JR., *Arty*

The cover of this thin volume, adorned with a seal titled "The Scientist's Library" and centered between the coldly clinical words *Biology* and *Medicine*, is misleading.

The real value of *Aggression* is for the leader or the leader-to-be. The book is wasted on the specialist, the professional staff officer, and the "when I retire" dreamer. However, the generalist will pick up important facts and impressions to add to his background of knowledge and experience.

"Why do men fight?" has long been a puzzler to many leaders. Actually, much is known about this and the author lays it out in a readable style. He examines the psychological, physiological, genetic, social, and ecological bases of aggression—all in nontechnical language. Also he explains how aggressiveness may be directed into useful or harmless outlets without provoking abnormal behavior or destructive fighting.

Research in aggressive behavior of individuals or groups finds no physiological evidence of any internal need or spontaneous driving force for fighting. Further, research demonstrates that all stimulation for aggression eventually comes from forces present in the external environment. The military leader can control many of these external forces and thus can control to a great extent the fighting qualities of his unit. The modern leader should learn these things in advance; he may not have the chance to learn them through years of experience.

Author Scott emphasizes the need for creating environments for individuals, for groups, and for nations which do not stimulate aggression. He does not provide a single simple answer, but does offer many practical suggestions.

Subscriptions to the MILITARY REVIEW may be obtained by writing directly to the Editor, Military Review, U. S. Army Command and General Staff College, Fort Leavenworth, Kansas. In the following countries subscriptions will be accepted at the addresses listed below:

Argentina

Secretario, Revista Militar,
Santa Fe 750,
Buenos Aires.

Bolivia

Revista Militar,
Ministerio de Guerra,
Casilla de Correos No. 70,
La Paz.

Brazil

Biblioteca do Exército,
Ministério da Guerra,
Rio de Janeiro.

Chile

Estado Mayor del Ejército,
Departamento de Reglamento
y Publicaciones,
Santiago.

Colombia

Ground Forces

Comando del Ejército,
Calle 10, No. 14-15,
Bogotá.

Air Forces

Comando de las Fuerzas Aéreas,
Calle 26, No. 13B-47U,
Bogotá.

Cuba

Ministerio de Defensa Nacional
del Ejército,
Ciudad Militar, Cuba,
Republica de Cuba.

Ecuador

Jefe Encargado de Publicaciones
Militares,
Ministerio de Defensa Nacional,
Quito.

El Salvador

Estado Mayor General de la Fuerza
Armada,
Departamento de Publicidad y
Bibliografía,
San Salvador.

Mexico

Escuela Superior de Guerra,
Oficina de Divulgación Cultural Militar,
San Jerónimo, México, D. F.

Nicaragua

Dirección de la Academia Militar,
Managua.

Peru

Ground Forces

Ministerio de Guerra,
Departamento de Información y
Educación de la Tropa,
Jiron Ancash No. 676,
Apartado 2483,
Lima.

Air Forces

Ministerio de Aeronáutica,
Academia de la Fuerza Aérea,
Lima.

Portugal

Revista Militar,
Largo da Anunciada, 9,
Lisboa.

Uruguay

Estado Mayor General del Ejército,
Soriano 1090,
Montevideo.

Venezuela

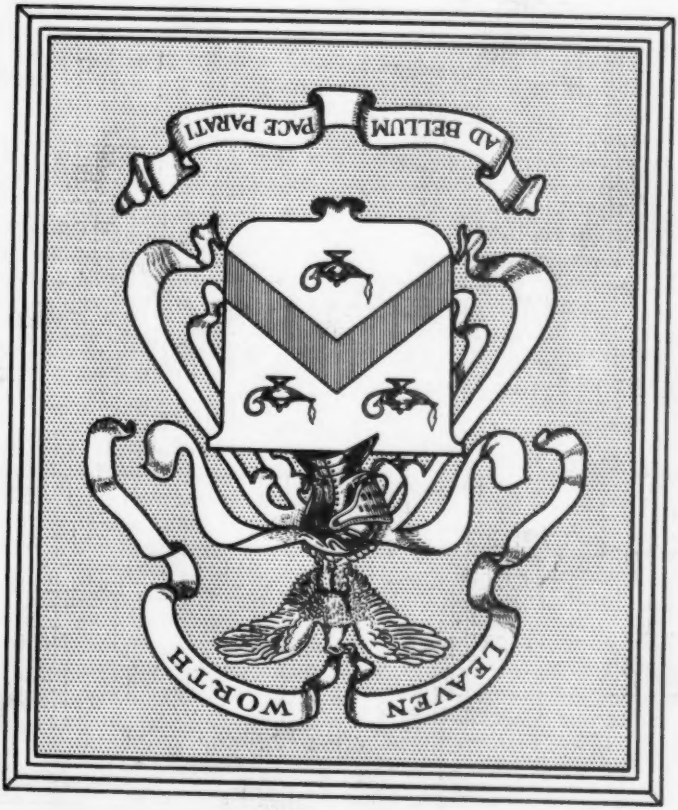
Jefe de la 2ª Sección del Estado
Mayor General,
Ministerio de la Defensa Nacional,
Caracas.

The MILITARY REVIEW and the U. S. Army Command and General Staff College assume no responsibility for factual accuracy of information contained in the MILITARY NOTES AROUND THE WORLD and the MILITARY DIGESTS sections of this publication. Items are printed for the purpose of stimulating discussion and interest, and no official endorsement of the views, opinions, or factual statements is to be implied.—The Editor.

XUM

XUM

Acquisition Division
New York Public Libry
5th Ave & 42nd St.
New York 18, N Y



XUM